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ABSTRACT

This course is the second of seven in the Information Systems curriculum. The purpose of the course is to build on the skills acquired in the prerequisite course, Computer Business Applications I, through the manipulation of word processing, spreadsheet, database management, and graphics software. An overview of the course sets forth the condition and performance standard for each of the five task areas in the course. These components are provided for each task area: behavioral objective, suggested teaching strategies, content, and summary. Topics covered include concepts, terminology, and components of professional workstations; hands-on operational knowledge of software and oral and written evaluations; factors to consider when comparing and evaluating computer equipment hardware and software; evaluation of and oral reports on a variety of hardware and software; and evaluation of a specific case study related to recommendations for office automation tools. A glossary of software terminology follows task area 2. Appendixes include visuals (transparencies and other teacher materials), student materials (student handouts, work sheets, and exercise materials), evaluation (end-of-task and end-of-unit questions, test items, etc.), and references (including an eight-page bibliography, articles, and resources). (YLB)

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Computer Business Applications II

course two

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In Cooperation with
ASSOCIATION OF INFORMATION SYSTEMS PROFESSIONALS
(AISP)

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COMPUTER BUSINESS APPLICATIONS II

The overall purpose of this course in the Information Systems curriculum is to build on the skills acquired in the prerequisite course, Computer Business Applications I, through the manipulation of word processing, spreadsheet, database management, and graphics (or integrated) software. Students may have acquired these skills through experience on the job, also. To build on this foundation, the following objectives will be accomplished in this course:

(1) Hands-on operational knowledge of software in the areas of desktop management, desktop publishing, communications, network management, records management, decision support, integrated, accounting, inventory, and others will contribute to the broad knowledge of the interrelatedness of the Information Systems in the automated environment.

(2) Comparison and evaluation of software, hardware, recording media, and storage/retrieval systems for an automated office environment is an important part of this course. In order to accomplish the intent of this course, laboratory time is strongly recommended. Also, four (4) hours' credit should be given.

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VISUALS

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STUDENT MATERIALS

Includes student handouts, work sheets, and exercise materials.

EVALUATION

Includes end-of-task and end-of-unit questions, test items, etc.

REFERENCES

Includes bibliography, articles, resources, etc.

INSTRUCTOR NOTES

COMPUTER BUSINESS APPLICATIONS II

CONDITION	PERFORMANCE/STANDARD
TASK AREA 1: Given a selected list of hardware, recording media, and storage/retrieval systems,	the student will be able to identify, describe, and define concepts, terminology, and components of the professional workstation to the satisfaction of the instructor.
TASK AREA 2: Given a choice of software applications from the following: communications (including E-Mail, telecommunications), network management, records management, desktop management, desktop publishing, decision support, integrated, accounting, or other available software,	the student will be able to define the terms, identify the structures and formats of the chosen software and produce documents which demonstrate an operational knowledge in setting up, formatting and manipulating the chosen software to the satisfaction of the instructor.
TASK AREA 3: Given a list of computer hardware, software, peripherals, storage devices, and other equipment,	the student will be able to develop factors to be considered in comparison and evaluation of strengths and weaknesses and in selection, modification, and utilization of automated equipment and software for information systems to the satisfaction of the instructor.
TASK AREA 4: Given a list of factors developed for the comparison, evaluation, selection, modification, and utilization of automated equipment,	the student will be able to (1) develop evaluative skills by comparing and evaluating automated equipment in the classroom lab or in vendor showrooms on a variety of automated equipment to the satisfaction of the instructor; and (2) present oral and written critiques and evaluations of the specific automated equipment, both individually and in groups, to the satisfaction of the instructor.

CONDITION	PERFORMANCE/STANDARD
TASK AREA 5: Given a specific case study related to the selection of computer equipment and software for an automated office,	the student will be able to (1) demonstrate the ability to make recommendations regarding the acquisition of specific hardware and software using the knowledges obtained in the critique and evaluation of computer equipment (hardware and software); and (2) prepare oral and written reports containing the specific recommendations to the satisfaction of the instructor.

Note: The nature of this course requires laboratory time to develop the necessary skills. For this reason, it is recommended that four (4) hours' credit be assigned to this course.

COMPUTER BUSINESS APPLICATIONS II

Task Area 1

Given a selected list of hardware, recording media, storage/retrieval systems, and other computer peripherals, **the student will be able to identify, describe, and define concepts, terminology, and components of the professional workstation** to the satisfaction of the instructor.

Suggested teaching strategies: Initial lecture and discussion regarding components of professional workstations; field trips to identified businesses and vendors (not forgetting resources which may be available in the educational environment); oral reports on outside readings by students to bring subject-matter material up-to-date; and in-class demonstrations by vendors or speakers from business and industry.

There are more than 100 manufacturers of various types of computer equipment used in information processing. The rapid rate of change in the technology and the large number of manufacturers make it difficult for an organization or an individual to decide which hardware and software will meet its needs. Consider, if you will, that this constant change is illustrated by the moving ducks in a shooting gallery. At some point in time, an individual or an organization has to decide to "fire" and make the decision to purchase equipment. In order to make this decision, individuals in an organization must have an understanding of the terminology, concepts, and components of the automated office environment.

The purpose of this task area is to provide an awareness of the hardware of the automated office. The professional workstation has been chosen to create this awareness because it groups together many information systems components: computers, storage media, printers, copiers, telephone, modems, networks, facsimile--just to name a few. **(Note to instructor: Exercise 1-1, a student handout, can be found in the "Student Materials" section.)**

COMPUTERS

An integral part of the professional workstation is the personal computer (also called a microcomputer or desktop computer). Its components are representative of nearly any computer system in use in the office today. As illustrated by Figure 1 below, it has a keyboard which serves as the input device, a disk drive (sometimes two) which runs software and serves as a storage unit, a video display which serves as an output device, a central processing unit, and possibly a printer as another output device. To understand the components of the personal computer (and other computer systems), the following sections will include concepts and terminology related to displays, keyboards, central processing units, storage/ retrieval, and related peripherals.

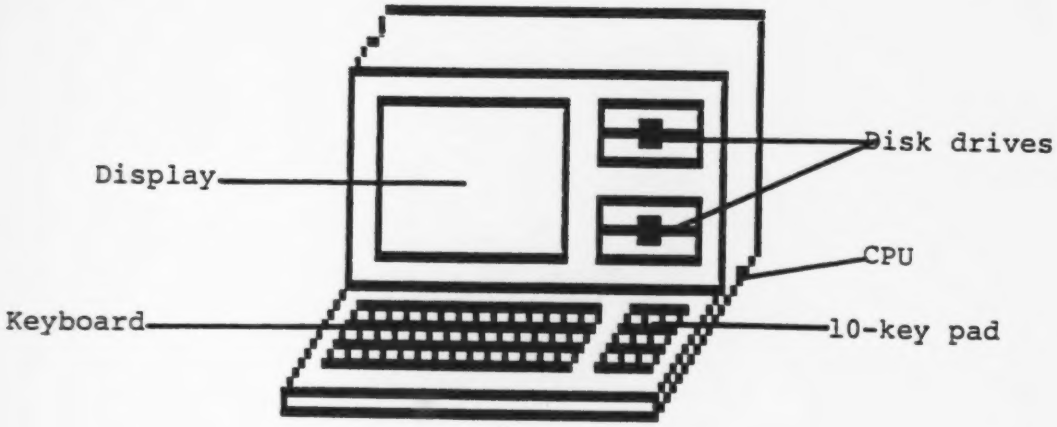


Figure 1.

Other categories of computers. Before microcomputer technology advances took place in the 1980s, computers were traditionally classified by the amount of computing power or the number of on/off signals or binary digits (bits) the computer could process at one time. The classifications included: (a) microcomputer, described as having an 8-bit processor and designed for one user; (b) minicomputer, described as having a 16-bit processor and designed for two or more users; and (c) mainframe, described as having a 32-bit processor and designed for many users. Microcomputers have become increasingly more powerful (16-bit, 32-bit, or greater) so that these categories are not as distinguishable. It is possible that in the future a desktop computer may have the computing power of a mainframe computer of the 1970s. The power and capabilities that this promises for the professional workstation are mind-boggling.

One additional category which has realized growth in the recent past is that of portable computers. Portable computers can be divided into three sizes: handheld, notebook-sized, and transportable. They are distinguishable by weight, size, display, mass storage, and internal memory:

Handheld computers may have the appearance of oversized calculators with less than full typewriter keyboard, a one-line display, have limited memory, and weigh less than three pounds. The cost for these computers can range from $75 to $300. Manufacturers of handheld computers include Sharp, Panasonic, Tandy, Quasar, and Hewlett-Packard, and others.

Notebook or laptop computers usually have full-sized keyboards, may fit into a briefcase or have a carrying case which resembles a briefcase, have a one- to eight-line flat-panel display, an average memory capacity (8K to 256K RAM) with storage on floppy disks, weigh between two and fifteen pounds, and cost between $700 and $8000. Manufacturers of laptop computers include Data General, Tandy, Panasonic, Grid Systems, Epson, Hewlett-Packard, Sharp, Toshiba, Teleram, and others.

Transportable computers may fit into a suitcase and have full-sized keyboards, one-line to full-page displays, offer memory of 256K to 2Mb RAM and storage on floppy disks, weigh from 15 to 35 pounds, and cost between $900 and $6000. Manufacturers of this size portable computer include Compaq, IBM, Sharp, Toshiba, among others.

(Note to instructor: Ask students to visit a vendor who sells a portable computer and make an oral report to the class.)

Displays

Because this personal computer has a video display, it is called a video display terminal (VDT). The video display is a TV-like screen (sometimes called a monitor) which allows the user to view the document as it is being keyboarded or retrieved from storage. The VDT enables the keyboarder to proofread, correct, make changes, and store the document in error-free condition. This eliminates the need for rough drafts, paper, and rekeying. The disadvantages of the VDT are that they are generally more expensive than non-display units and eyestrain can be a potential factor. Considerable research has been and is being done in this area regarding the effects of working with VDTs. **(Note to instructor: Outside readings and reports by students regarding studies in this area are suggested. Several studies have been completed by National Institute of Safety and Health [NIOSH], among others.)**

Basically, the features of VDTs which should be considered when purchasing computer equipment include:

(1) Number of lines presented (displayed) on the screen: from 1 to 66; full page, partial-page, or one-line (also called thin windows). In the past, full-page displays were considered to be easier to adapt to; however, the more sophisticated software allows viewing of a full page of hard copy in reduced size on the screen. Therefore, this characteristic may not be as critical in the future.
(2) Wraparound capability (width of screen)
(3) Scrolling capabilities from top to bottom of screen
(4) Color of screen: green on black, black on white, amber on black, etc.
(5) Non-glare characteristics
(6) Color and graphic displays: A consideration when information must be created and presented in graphic form: charts, maps, diagrams, etc. Couple the graphic capability with a multi-color printer ribbon or plotter and the result is high quality presentational graphics. Color displays also allow the use of one to several different colors on the screen; many software packages use this capability to display various editing features. High resolution (clarity) displays are necessary for high quality graphics.

In addition, there are four major technologies used in video displays which relate to resolution (clarity of characters on the screen), size, and weight. These four are described and discussed below:

(1) Cathode ray tube (CRT) acts just like a television picture tube in that character and graphic images are projected on the screen when electronic impulses generated from the keyboard to a mechanism at the back of the tube are fired at and strike the chemicals that line the screen. Screen sizes range from 5 to 15 inches diagonally. A screen that is 7 inches or larger can provide 80 characters wide by 24 or 25 lines deep, which is a requirement for most sophisticated word processing software.

(2) Liquid crystal display (LCD) is the display which is used in digital watches. This type of display utilizes chemicals on a piece of glass to produce the image. Applying electricity to the LCD causes the characters or images to appear nearly black against a light gray background. LCDs are used in battery-powered computers since they require less electrical power than any other display. Most

LCDs present 2- to 8-line displays at a time; the width of the screen may vary from 20 to 80 columns.

(3) Electroluminescent display (EL) is made up of a grid of metal connections pressed between two pieces of glass. When electrons (electronic impulses) pass through the connections of grids, different portions light up or glow, creating the characters or graphics on the screen. ELs are fast, have high resolution (clarity), and can present 24 lines deep by 80 columns wide. ELs use much electricity, although batteries can be used for short periods of time. ELs are the newest display technology and are quite a bit more expensive than the CRT or LCD.

(4) Gas plasma display is similar to EL in that gas is pressed between two glass plates which are made up of thousands of wires to form a grid. When electricity passes through the plates, characters or images are formed when the electricity hits the interconnection of grid wires causing the gas to glow. Gas plasma display generates heat and requires a great deal of power. Its use has been limited to very small computers. Screen display with gas plasma varies from one line or less to full and dual displays.

A flat-panel display screen is now available which has the potential to make obsolete the CRT and the television picture tube. A flat-panel display is lighter and less bulky and uses less power than does the CRT. The change in size and weight permits the screen to be used on portable systems now seen in many settings.

Non-display terminals can be a component of a professional workstation, although this category of terminal represents a very small number in the office today. These terminals (also called blind terminals) print output (hard copy), using the same piece of equipment for inputting and outputting and are sometimes called I/O terminals. Non-display terminals do not provide a view of the document as keyboarding, corrections, or revisions are being made. This is its biggest disadvantage. Obviously, the advantage of this type of terminal is its lower cost.

Keyboards

The term most often associated with using a computer keyboard to enter data into a computer system is called keyboarding. Information entered in this manner differs from typewriting in that keystrokes in the form of characters and graphics can be stored or saved to be reused or changed. The keyboard is considered the main input device in the professional workstation; however, it is not the only input device. Keyboards and other means of inputting information will be discussed below.

It is generally agreed that all levels of employees in an organization will need to have the skill of keyboarding (by touch) in order to efficiently and quickly enter and access information. **(Note to instructor: Ask students to read an article related to keyboarding skills and report to the class.)**

Although the keyboard on a personal computer or other computer system resembles an ordinary typewriter keyboard, there are distinctive differences. Each of these differences is noted and discussed below:

Alphanumeric keys include the ordinary alphabet and number typewriter keys, generally found in the same location, and serve the same purpose on a personal computer or other computer system as on a typewriter.

Function keys on a computer keyboard perform various operations. These keys are found in a separate group, row, or pad to themselves. Pressing these keys does not cause characters or images to appear on paper or printout. Their function is to allow the user to perform such formatting and editing tasks such as centering, moving text, searching and replacing, obtaining help, bolding, underlining, and others. Two categories of function keys are found on the keyboard:

Soft function keys are "soft" because their function changes as the system moves within an application or from application to application. These functions include REPLACE, DELETE, CENTER, BOLD, UNDERLINE, etc.

Hard function keys are "hard" because their function remains the same no matter what application is used. For example, ENTER, CAPS LOCK, PRINT SCREEN, TAB, etc. are representative of hard function keys.

Recently, a number of keyboards have been designed with a layout of keys labeled from F1 to F12. The functions of these keys change depending upon the software used. Using the function keys is a unique feature of all computer systems.

Function keys are used either alone or in combination with another key, such as CONTROL, CODE, ALT, SHIFT, etc. Function keys assist users to become more productive in formatting (margins, line spacing, centering, bolding, underlining, tab settings, justifying); locating (search and replace, carriage return, space bar, backspace, cursor); and editing (delete, insert, move, replace, copy, merge, and erase).

Dual-functions keys are necessary on a computer keyboard to keep the number of keys to a minimum. These are usually identified by having words written on both the top and front side of the key and are used with a special key, marked CODE or CONTROL. By depressing the CODE or CONTROL key and the dual-function key, an alternative function is performed.

Command keys represent a group of keys which instruct the word processing or other applications software to do something. These may be labeled YES, NO, ENTER, STOP, ESCAPE, EXECUTE, or RETURN. These keys may be activated in response to a prompt, which is a question or statement in the applications software that guides the user in performing certain operations.

Many software manufacturers provide keyboard templates and quick reference cards. The templates fit across the top or around the side row of function keys, depending on the keyboard layout. Templates provide an easy reference for identifying the necessary keys to execute the major formatting and editing features within the software. Quick reference cards provide a more complete listing of the software features and the keys used in performing the functions.

A keyboard may be purchased separately on some computer systems; with some systems a variety of keyboards may be available. Important considerations in purchasing a keyboard for a computer system include: the ease of use of the keyboard, noise (if any), location of the special and functions keys for easy access, a separate 10-key pad, and the reliability of the keyboard itself.

Other input devices which may be available in the professional workstation include:

(a) a light pen which the user simply points to the screen where action is desired and depresses a designated key. The software senses where the light pen is located and responds with the appropriate action. To save keystrokes, the user may point the pen to a menu and select a task by tapping the appropriate point on the screen. Some light pens also permit the user to draw on the screen.

(b) an OCR or optical character reader which may be used to scan typed material for the purpose of entering the data on to the screen for revising, editing, formatting, and eventual output as a final document.

(c) a communicating word processor used to send information to a professional workstation on a local area network.

(d) a voice entry or voice processing unit which may be the device used to enter original information.

(e) a disk which provides a source of information input for recalling stored data.

Central Processing Unit

The central processing unit or CPU on a personal computer or other computer system is needed to direct the activities of the computer. Inside the personal computer is what is called the motherboard which includes the chips and instructions for carrying out every activity of the system.

Another important part of the CPU is the quartz crystal clock which coordinates the electrical responses of the computer. Upon turning on the computer, electric current causes the clock to vibrate, at a constant rate, many times at millions of times per second. The crystal in the clock releases voltage pulses which are combined with other signals to control the speed of action on the motherboard and ensure that the electrical paths stay in phase.

The motherboard also includes ports for entry into or exit out of a CPU for connecting other devices, such as printers, modems, plotters, disk drives, etc. There is also an area for holding different types of internal storage devices.

There are three different types of chips contained on the motherboard in the central processing unit: the microprocessor chip which functions as the "mind" or logic of the unit; the microcomputer chip which is a total small computer system that contains both microprocessor and memory and controls the input/output to and from outside devices; and the memory chips which function as temporary save areas in the CPU that are needed when working on a document utilizing applications software or when writing a computer program. The memory chips may also be called working storage or main computer storage.

Two types of memory chips with which a user will want to be familiar are RAM and ROM. Each is discussed below:

RAM, random access memory, refers to instructions or data that are not stored permanently. It is possible to store and locate data while the computer is on with RAM chips. Once the computer is turned off, the contents stored in this memory disappear. The term volatile is often used to describe the inability of this type of memory to retain its contents after the equipment is turned off.

RAM chips are also considered to have read and write capabilities because the user can read what is held in memory and write into memory. These data can be changed, added to, or erased. Computers systems are purchased by the amount of RAM the CPU contains; i.e., 640K (kilobytes), 1 Mb (megabytes), etc. The more RAM a computer system contains, the higher the cost and the more sophisticated the software that can be run on it. Desktop computers are now capable of containing as much RAM as some earlier mainframe computers.

ROM, read only memory, contains instructions or data that are permanently stored in memory by the manufacturer. ROM chips are said to have read only capabilities because the user can read what is in memory but cannot write into it. These chips make it possible for information to appear on the screen of a computer system when it is turned on. The term nonvolatile is often used to describe the read only capability of this memory which is not erased when the system is turned off. To avoid software piracy, many applications software manufacturers are placing their software on ROM chips. Task Area 2 discusses this in more detail.

Two other types of ROM chips also are being used and are discussed here: PROM, programmable read-only memory, differs from ROM only in that the user, not the manufacturer, programs the memory. Once the chips are programmed, however, the contents cannot be changed. PROM is like a blank ROM which allows the user to enter any desired permanent program only once. After that, the data are nonvolatile. EPROM, erasable programmable read-only memory, allows the user to program instructions or data but the instructions or data can be erased and new ones inserted. It is possible to erase and reprogram a mistake while programming the chip. With PROM, the chip would have to be thrown away.

A new kind of memory which has come into use with the handheld and portable computers is called CMOS, complementary metal oxide semiconductor. CMOS is used for portables because it can be used away from a source of power since a battery can provide enough ongoing power to enable the contents of storage to be retained in memory. Technically, CMOS is considered a type of RAM memory.

STORAGE/RETRIEVAL
(Recording Media)

When the storage locations in a computer's memory are filled, equipment cannot function. Therefore, another type of storage called auxiliary storage (also known as external or permanent storage) is needed. This kind of storage is located outside of the main box or compartment where the main memory is located and is often contained on external media that often have to be inserted into the equipment for the contents to be read into memory. Auxiliary storage is used to hold information not needed immediately so that it can be moved back and forth into memory as needed.

Many different types of auxiliary storage media or recording media have been developed, as follows:

Paper tape is a strip of paper on which characters are represented by combinations of holes punched across the strip. The holes represent characters to be read by the machine and reproduced on paper. This was one of the first storage media developed.

Magnetic tape is plastic-like tape coated with a chemical compound (oxide-coated Mylar film) on which information may be stored. It is still used as storage in data processing because it is a relatively inexpensive way to store large amounts of information which are not frequently needed. It was also used in cartridge form by an early word processing system--the Magnetic Tape Selectric Typewriter (MT/ST). Many personal computer systems use magnetic tape in cassette form for back-up copies. It may be purchased in cartridges, reels, and cassettes. It is possible to store 23,000 to 80,000 characters or about 25 to 60 pages on magnetic tape. Access to stored information on magnetic tape is sequential; in other words, each piece of information stored on the tape must be read in sequence. This is sometimes called serial access. Sequential access to stored data is slow and tedious.

Magnetic cards are media that were used in dedicated word processing applications but never in data processing because they were too small to hold large volumes of data. These cards should not be confused with punched cards used in early data processing systems, since these cards are plastic-like cards coated with a chemical. They were used with what was called the Mag Card typewriter and were ideal for storing one page of text such as a letter or a page of a report. About 50 lines of information can be stored on one card. Some dual-sided cards also permit the user to record on both sides of the card doubling the card's storage capacity. Access to information stored on magnetic cards is accomplished sequentially.

Floppy disks are thin, lightweight, and flexible pieces of disks which are sealed in a plastic jacket that gives them a square appearance. The flexibility of the plastic gives the disk its name--floppy. The surface of the plastic is coated with a magnetic recording substance. Storage capacity of the floppy disk ranges from approximately 278,000 to 556,000 characters per disk or about 15 to 75 pages of text and codes. These disks come in three sizes: 8", 5-1/4", and 3-1/2". The 3-1/2" disk is more rigid than the two larger ones and has a greater storage capacity because of the configuration of the disk. For computers to use disks, they must have disk drives. A disk drive contains a read/ write head and may be placed next to the keyboard of the computer (called an external disk drive) or may be part built into the computer itself (called an internal disk drive). A combination internal and external disk drive configuration may be used with a personal computer. Access to stored information on floppy disks is random access. Random access media allow the storage location to be accessed about as quickly as any other location. In other words, each piece of information does not have to be read in order. Random access is faster than serial access.

Hard disks have the capability of storing a large amount of information in the same space required of several floppy disks. These hard disks, originally called Winchester disks, refer to a number of disks contained in a sealed, boxlike unit that rotates or drives the disks. The entire unit is referred to as the Winchester disk drive. The disks cannot be handled or removed from the box. They are sealed in the unit because information is packed so closely on the disk that it could be easily destroyed. Since they are sealed in this container, they are protected from damage caused by heat, moisture, dust, and other elements which could harm or destroy the data. Smaller hard disks are available for the personal computer which are capable or storing five to ten million characters--once thought to be the storage capacity of large mainframe computers. Access to information stored on hard disks is accomplished at random.

Floppy disks and hard disks are the primary storage units used in personal computers. Other forms of storage are becoming available which hold promise of extending memory capacity for personal computers. These include RAM disks, bubble memory, holography, and optical disks.

RAM disks are actually not disks at all, but provide excess memory capacity which is not used by the applications software. When a RAM disk is installed, the computer thinks of it as another disk drive. The advantage of the RAM disk is its speed of access; its disadvantage is that it is RAM--volatile memory. The RAM disk can be utilized to load all of the applications software programs for use during the day. In this way, programs can be accessed as needed without having to stop and load software every time applications programs are changed. However, when the RAM disk is turned off, the contents disappear. The same process can be used the next day and so forth.

Bubble memory contains tiny bubbles floating on a sea of magnetic film. Bubbles move around on magnetic paths or tracks; the magnetic film does not move. It is solid state and nonvolatile. It is ideal for environments where computers might not hold up well or where they receive harsh treatment making it an ideal memory for portable computers. Bubble memory offers several advantages: it uses less power; it operates faster than magnetic tapes or disks; and it is more reliable and more compact. The disadvantages include cost and availability. Only a few vendors make it available.

Holography is a lenseless, photographic method of internal storage that uses laser light to produce three-dimensional images. The high-storage capacity of holography is staggering. It has the possibility of storing 1 trillion bits of information (1 terabit) or the equivalent of 10 million typewritten pages. Other advantages include low storage costs, fast transmission rates, and smaller storage areas than microfilm. This technology is still under development.

Optical disk storage uses a laser beam to scan information and then place the image onto a disk for permanent storage. Laser storage technology is designed to hold tremendous amounts of information--approximately 4 gigabytes (1 gigabyte is equal to 1 billion bytes of storage) or 500,000 typewritten pages. An optical disk the size of an audio compact disk can store an entire encyclopedia--with room to spare. Already a special kind of optical disk called CD-ROM (cassette disk-read only memory) is used by large database services to store information which is then made available to customers. (Examples of databases which presently utilize this type of storage and make it available to libraries include Reader's Guide to Periodical Literature and Educational Resources Information Center [ERIC].) The advantages of optical disks include fast retrieval; ability to store images, sound, and motion pictures; and high capacity storage. Disadvantages include the need for special equipment, the inability to alter information once it is stored, and cost. Despite the drawbacks at the present time, optical disks may hold the key to altering storage technology concepts and capabilities.

PERIPHERALS

The main components of the information processing system have been described above: the keyboard, the video display, the CPU, and the storage/retrieval unit. All other devices within the professional workstation are peripherals. Several of the peripherals which will be discussed below include printers, scanners, image processors, and telecommunications equipment, including networks.

Printers

Printers are used for one type of output from a computer--they convert stored keystrokes into hard copy. Printers are considered peripherals because they are not a required component of the professional workstation. Separating the printer from the keyboard allows the user to keyboard on one document while printing another document. This is called background printing. Figure 2 is an illustration of a basic printer.

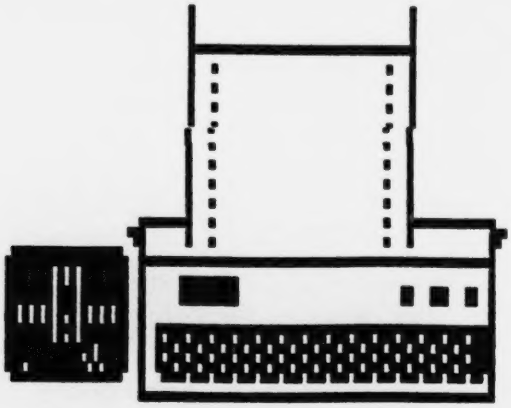


Figure 2.

Printers vary in speed, quality, and methods of creating images. They can print a character at a time, a line at a time, and a page at a time. The paragraphs which follow describe the types of printers useful in an automated environment:

Letter-quality printers

These printers produce fully formed, dense characters that can be defined as camera-ready text or graphics. The fully formed characters are generally defined in terms of "resolution", which is a measurement of dots per inch or per square inch. Some letter-quality printers print characters that are 300 to 400 dots per inch; other print a resolution of 100 x 100 dots per inch. Generally, letter quality printers are considered to be slower, printing at 10 to 80 characters per second (cps); however, other highly sophisticated letter quality printers print at 10 to 30 pages per minutes.

Laser printers, daisy wheel printers, thimble printers, and typewriters are examples of printing devices which produce letter-quality documents. These printers are generally more expensive than near letter quality printers and dot matrix printers.

Near-letter-quality printers

These printers produce characters which are slightly less than what one would consider a letter quality standard. The density of the characters, the resolution, and the number of dots per inch are not as fully formed as is found in letter quality printing. Many printers producing near letter quality documents are also dot matrix printers. The mode of printing is selected by a touch panel on the printer. Manufacturers of near-letter-quality printers include Panasonic, Epson, NEC, among others.

Dot matrix printers

Also called nonletter-quality printers, these printers are used often on microcomputers to produce rough drafts of text, data processing applications, or graphics. Since the characters produced are not solid characters, but are composed of tiny dots, printers that use this method are referred to as dot matrix printers.

Graphics printed with dot matrix printers are limited to simple charts and diagrams that can be presented in rows and columns since these printers have difficulty printing images with rounded shapes.

Dot matrix printers are faster, with print speeds ranging up to 600 characters per second or 230 lines per minute, and less expensive. Dot matrix printers can produce multicolored graphics.

Since 1986, manufacturers of dot matrix printers have been producing a product that less obviously looks like it was printed by a computer. Future dot matrix printer technology will enable these printers to print 300 cps in letter-quality word processing mode and about 800 to 900 cps in draft mode.

Ink jet printers are dot matrix printers where characters are shaped by electrostatically spraying a very fine hairlike stream of ink dots onto paper. The ink must dry by being absorbed into the paper. The resulting print quality is similar to that of a typewriter.

Intelligent printers combine laser, microprocessor, and some photocopying technology. They are actually high speed page printers. Sometimes they are referred to as copier/printers because they combine both printing and photocopying features such as placing images on both sides of paper, collating, stacking, and stapling collated copies.

Manufacturers of some intelligent copier/printers can operate separately as a copier or together with mainframe computers or microcomputers. A link can be provided by these printers between various information processing equipment by accepting input or information from magnetic disks or through communication lines (telephone lines or cables) from one computer to another. One other characteristic of this type of equipment is its ability to use many fonts or typefaces.

The advantages of intelligent printer/copiers are speed, quietness, and ability to produce phototypesetting quality printing using many typefaces, different type sizes, and line art. Many other uses can be made of intelligent copier/printers: storing preprinted forms, eliminating storage space for forms; merging newly keyboarded and stored information into a new document to be printed and forwarding documents to other locations; and producing multi-page documents in collated sets.

Plotters

A plotter places straight, curved, and possibly continuous or three-dimensional images onto overhead transparency film, paper, or slide film. It extends the capability of dot matrix printers by producing graphics in colors and in ready-to-use format. Most plotters used in business applications today are called pen plotters.

The pen plotter operates upon commands from the computer to lower, raise, move, change colors, or perform other functions according to the applications software. A dozen or more colors may be available. The lines are drawn in fractions of seconds.

Some graphics software is called lettering software. With this kind of software, mixes of fonts, sizes, and colors can be generated by the software. Character sizes from 0.05" to 72" can be drawn with a wide selection of spacing and shading. Manufacturers of this kind of equipment include Hewlett-Packard (ColorPro), Enter Computer, Inc. (Sweet-P plotter and TypSet software), among others.

Selecting a printer or plotter

Factors to consider when selecting an appropriate printer include: application, speed, print quality, and cost--and not necessarily in that order. What kinds of information are used in this business? What kinds of documents are produced by the business using this information? Who needs and reads the information and documents? How soon is the information needed? What is the budget for purchasing and maintaining this equipment? Where will it be located and who needs it? Before an organization can make these decisions, it must know the uses made of its information.

SCANNERS

The optical character reader (OCR) is another peripheral device used in information processing. Optical character recognition is a technology that scans (reads) a typewritten page of type and places the contents of the page on magnetic media or into RAM memory that can then be read on a VDT by the operator. It is much like a photocopier, except that a photocopier copies an original onto paper; the OCR copies an original into memory or onto magnetic media. The accuracy of OCR is fewer than 1 error in 100,000 characters.

OCR has been used in the data processing industry to read marks or symbols coded on paper documents and convert them into electrical impulses. Evidence of OCR technology is seen in retail stores and grocery markets to speed up the check-out process. In this industry, IBM, NCR (National Cash Register), and Honeywell have refined OCR technology, causing prices to drop for this equipment and making this technology cost effective for retailers.

Originally, the benefits of OCR included shorter turnaround times in producing final copy; rekeying was eliminated; word processing equipment was used for editing and revising; every typewriter in the office became an input device, thus cutting down on the amount of automated equipment needed; and less disruption was caused when converting to automated equipment. These benefits may have been mitigated by the lower costs of automated technology making it possible for every executive, manager, professional, technician, and support professional to have his or her own workstation in the future.

Manufacturers of this type of equipment for the automated office include Hendrix, Totec, Context, DEST, Kurzweil, and CompuScan. Desktop scanners are available, also, for Macintosh and IBM computers, among others.

Factors to consider in OCR selection include (1) the time it takes to get this equipment installed and running properly; (2) training time of persons inputting data on typewriters to learn error and coding techniques, as well as correct insertion of paper into the OCR; and (3) equipment (connecting device) which allows the information processing equipment to be used for other purposes while receiving text which is being scanned by the OCR.

IMAGE PROCESSORS

Image processors are pieces of equipment that produce copy containing not only text but graphics. Several image processing systems are discussed below:

Copiers

Older reproduction processes related to an organization's paperwork included carbon, offset, mimeograph, and spirit masters (also called dittos). Although a small number of offices may still use one of the processes above, more and more are turning to photocopying technology. This type of technology photocopies the image of the original document as many times as needed. Manufacturers of this type of equipment include Xerox, Savin, 3M/Harris, IBM, and others. In addition to copying capabilities, there are other options available: sorting, stapling, reducing, enlarging, color printing, automatic document feeding, communications, E-Mail, remote computer printing, multiple paper trays, and so on.

Abuses abound since the introduction of photocopying equipment into the office: copying material for personal or nonbusiness use; copying large quantities of materials which could have been done more economically by other methods; duplicating files; copying more copies than are actually needed; wasting copies because of operating negligence; etc. To counteract these abuses, organizations have used some of the following methods to control the use of photocopy equipment: placing the equipment in a centralized location;

providing a log of copier's name, account number, and number of copies made; hiring an operator; limiting the use of the equipment to certain people and offices; using control cards for employees or departments which count the number of copies made by persons or departments. Many organizations have experienced almost overnight increased costs and lower productivity with the introduction of this equipment into the office. It is estimated that 30 to 60 percent of the copies made on a single machine in an average company are due to the misuses listed above.

Phototypesetters

Phototypesetting is a photographic printing process that uses film to produce an image with a computer. Large numbers of typefaces and type sizes are available with phototypesetters to use in determining the page composition. Phototypesetters can vary type styles and sizes, the spacing between lines, as well as the placement on a page. Strips of copy are produced by the phototypesetter; photocomposers then set up the pages. It is possible to key the document to be formatted on word processing equipment and send it to the phototypesetter without rekeying, if the media used on the word processor are compatible with the phototypesetting equipment. Other methods of inputting to phototypesetting equipment (including OCR, disks prepared on word processing equipment) can be accomplished as long as an interface device can link and integrate technologies together such as word processing, data processing, and phototypesetting. This device is referred to as a black box.

The major advantage of phototypesetting equipment is speed. It is also possible to get at least two pages of typing onto a single phototypeset page. Thus, advantages also include saving paper and paper handling, saving printing and filing time, reducing weight, and cutting mailing costs.

The primary differences between inputting information using word processing software and inputting information into a phototypesetter is that the material to be typeset has to contain additional instructions (codes). These codes have to do with size of characters, amount of space between lines, font type, page format (margins), indentions, etc. If the material to be typeset is entered with word processing equipment, the codes can be entered as symbols; the phototypesetter will then go back and replace the symbols with the necessary codes. In this way, the person who operates the word processing equipment does not have to learn phototypesetting codes.

The in-house printing which combines the technology of information processing with phototypesetting offers the advantages of saving time in preparing final copy, of reducing the effort involved in rekeying and reproofreading a document, and of storing material for future references and revision--all of which save money.

Some manufacturers who have focused on integrating information processing applications and phototypesetting include Compugraphic, CompuScan, Digital Equipment, Itek, and Wang.

Intelligent printer/copiers (as discussed above) can be used as an output printer for information processing in place of or in addition to letter quality printers, dot matrix printers, or phototypesetters.

There are certain factors to be considered in selecting a reprographics process, such as:

1. Copy appearance: What is the quality of the final copy?
2. Number of copies: How many copies can be made economically for each method? There is usually a point where an economical length of run dictates the method used unless there are other mitigating considerations.
3. Paper size: What is the size of the original to be copied or the size of the paper to be printed? Concomitant with the paper size is the quality of the paper: What use(s) will be made of the copies? Who gets the copies?
4. Speed: How much time is involved in producing the copy and how much is allowed for the completion of the entire job? Speed can be referred to in a number of ways: copies per minute, impressions per hour, and pica newspaper lines per minute.
5. Costs: What is the cost per copy to produce the document? What does it cost to prepare the master or page layout? What does it cost to use the equipment? What is the cost of the paper and other materials?

TELECOMMUNICATIONS

Telecommunications involves communicating electronically across distances (generally over telephone lines) without any changes occurring to the original message. All forms of information may be sent electronically: voice, text, data, graphics, and video. The use of the computer as a communicating device has grown in importance in both business and personal applications. Telecommunications will continue to change traditional methods of communication within the professional workstation.

In order to utilize telecommunications, special communication equipment and sophisticated programs may be combined in a variety of configurations: small computers or terminals to large mainframe (host) computers, large computers to large computers, and small computers to small computers in local area networks. The hardware components which are necessary for communication remain the same regardless of the size of the computer.

Different types of communications software packages are available depending on the users' requirements. The more sophisticated the software, the more dynamic the applications. For example, software may allow large amounts of data to be transferred from a database on a mainframe to a personal computer for storage on auxiliary storage (called downloading); it may allow data to be transferred from files on the personal computer to databases on the mainframe (called uploading); or it may establish passwords and perform other security functions; etc.

For communication to take place from one computer to another in a remote location within a building and sometimes outside of or to other buildings, a special piece of hardware is needed:

MODEM (modulator/demodulator): converts digital data generated by the computer to an analog signal which can be sent or received over communication channels. It also converts analog signals received from telephone lines to digital signals which can be understood by the receiving computer. In such cases, the existing telephone network is used because it is a well-established system for communication. Two modems are necessary--one at either end of the telecommunication process. Modems are required whenever data are transmitted over lines requiring an analog signal. Some communication channels are capable of directly transmitting a digital signal. These channels do not require a modem.

Modems may come in the following varieties:

Acoustic coupler: is connected to the computer by a cable and utilizes a standard telephone headset which is placed into molded rubber cups on the acoustic coupler. The acoustic coupler converts the digital signals generated by the computer into a series of audible tones which are picked up by the mouthpiece in the headset in the same manner as if one were speaking into the telephone. The analog signs are then transmitted over the communication channel. Advantages of acoustic couplers include portability; may be plugged into any telephone, including a pay phone, anywhere; and the telephone can still be used to make telephone calls. A disadvantage is that it may be less reliable than other modems because even small outside sounds can be picked up by the acoustic coupler as sounds which are to be transmitted.

External modem: (also called direct connect modem) is attached to the computer by a cable and is contained in a small boxlike structure placed next to the computer. A cord from the modem plugs directly into a standard telephone jack to allow communication over telephone lines. There is no need for a telephone headset, only access to a telephone line.

Internal modem: cannot be seen because it is found inside the computer. It consists of a printed circuit board with related electronics, that is plugged into an empty slot on the motherboard of the processing unit of the computer. Several advantages: no work space is required outside the computer, no computer-to-modem cable is required, and it often costs less than external units. A disadvantage is that the internal modem is machine dependent and is designed to fit a specific computer, while an external modem can be used with any computer equipped with an RS-232 interface.

Intelligent or smart modem: more sophisticated modems contain a microprocessor that controls many functions, allowing easier and more flexible use of telecommunications. For example, smart modems allow frequently used telephone numbers that access host computers to be dialed automatically. A personal computer can be set to automatically answer an incoming call and accept data.

Modems are generally classified as low speed (1200 bps and below or 130 wpm), medium speed (1200 to 4800 bps and above or 130 to 530 wpm), and high speed (4800 bps and above or above 530 wpm).

Different types of communication media are used when data are transmitted over distances: telephone lines, coaxial cables, fiber optics, digital lines, microwave stations, and satellite relays.

Traditionally, workers in the office have used the telephone, the business letter and memorandum, Western Union (TWX or telex), and the U. S. Post Office to deliver information. The technologies just described above are important in the development of telecommunications (electronic) delivery systems. In fact, these systems are changing the way the delivery of information is viewed in the automated office. They are now being considered the areas in which the greatest strides in productivity and cost savings can be realized.

Several other categories of formats into which information can be sent from the professional workstation using electronic delivery systems include electronic message systems and computer-based message systems, facsimile, communicating word/information processors, and teleconferencing. Each delivery system in these categories is discussed below.

Electronic Message Systems

Computer-based message systems (CBMS) are value-added products on private branch exchanges (PBXs) and computer systems. A large part of this market is made up of the many electronic mail software packages which can be purchased off-the-shelf. However, these services are also provided by subscriber services from such companies as AT&T Information Services, MCI Communications Corporation, Western Union, ITT Dialcom, GTE Telenet, and McDonnell Douglas. These systems are useful when telephone tag is a problem; when telephone interruptions are a problem; when information is incomplete, late or late appointments are a problem; when time is wasted for social exchanges; when a person wants to get in touch with someone but does not know where the person will be; when time zones are different; or when the message has to go to several people.

Computer-based voice message systems (CBVS) allow a caller the option of leaving a message with a message center or asking to be connected to a voice storage device. The system records voice messages, converts them to digital format, and stores them in a mailbox to be accessed by the appropriate recipient. This system can be used when a person wants to save time and choose whether to leave a message or talk to the person directly. Voice reminder systems and voice store and forward systems also are part of voice message systems. These systems are used when a person needs to be reminded of important appointments or when a person prefers to leave a spoken message rather than a keyboarded message. All of these voice message systems avoid the same problems as computer-based message systems (telephone tag, late appointments, differences in time zones, etc.)

Facsimile

Facsimile (FAX) is a type of copier that electronically sends an original document (letter, map, chart, picture, contract, etc.) from one location to another where it is reproduced as a copy or "facsimile" of the original document. Actually, the transmitting copy is scanned by a light source (lens, laser, or fiber optics) that converts original material into electronic signals. In many types of facsimile equipment, signals are sent by placing a telephone receiver into an acoustic coupler which then reverses the process and produces a hard copy. Another name for FAX is telecopier. Speed, copy quality, and compatibility are important factors in selecting facsimile equipment. FAX can be used when a copy of a graph, chart, or picture is needed quicker than through traditional means and/or when a person's signature is needed.

Communicating Word/Information Processors

A communicating word/information processor makes it possible to send keyboarded mail, messages, and documents electronically between two points or terminals. When a communicating word/information processor is connected to another piece of equipment that also communicates, it is said to be "on line". One important use of communicating word/information processors is to be able to send long documents which need to be revised and/or worked on by several people. This saves rekeying, prevents errors, and saves time. A communicating word/information processor may be connected to peripheral equipment such as OCRs or phototypesetters for increased capabilities.

Teleconferencing Systems

The term teleconferencing means conferring, discussing, or communicating data, text, graphics, audio, and video by telephone or other media between two or more people at two or more locations. It provides information in a timely manner, saves travel time and money, and saves meeting time. Elements of teleconferencing include interactive cable television, audio teleconferencing (voice only), and video teleconferencing. Links may include transmission via microwave stations, coaxial cable, cable television systems, satellites, or other means.

Audio teleconferencing is an example of a telephone conference call. Slow-scan video is a still-frame picture updated periodically (every 30 seconds using telephone lines) and is displayed on a TV screen; cable TV is a mass communications medium with some audience involvement. Video teleconferencing is full-motion TV linking individuals or groups at two or more locations. Cost is increased as video capabilities are increased. (The professional workstation which has video teleconferencing capabilities may be located in a conference room or other centrally located facility so that a number of people may be involved at one time.)

NETWORKS

The professional workstation also may be part of a network within the automated office which extends its capabilities. The various hardware components of telecommunication must be organized into a system or network for efficient, effective use. Basically, a network is composed of computers of various sizes, workstations, communications hardware and software, and connections that enable the network to function productively. Three kinds of networks are described below.

Public databases are databases usually designed by service organizations and which may be used in lieu of an independently designed network. The Source (Reader's Digest Association, Inc.), Compu-Serve (H & R Block), and Dow-Jones News/Retrieval (Dow Jones) are examples of the largest public databases available. These databases offer marketing information, communications, entertainment, and a variety of other services. Costs to the end user include software, a registration fee, an hourly use fee, and/or a monthly fee.

There are well over a thousand on-line telecommunication vendors in the United States. Some are gigantic utilities offering vast libraries of data. Most can be classified as modest bulletin board systems.

A wide-area network, also called a value-added network (VAN), is defined as any transmission or reception of signals, of writing, and of sounds by wire, radio, visual, or electromagnetic systems. The companies which have developed these networks generally lease lines from common carriers. They are designed to interface voice, video, FAX, data communications, and teleconferencing capabilities. A partial list of wide-area networks include CYLIX (RCA Communication Network), ITT World Communications, Inc., SBS (Satellite Business System composed of IBM, COMSAT General Corporation and Aetna Life and Casualty), SKYNET (AT&T), SPRINT and TELENET (GTE Communications Corporation), and TYMNET (Tymshare, Inc.). These services use a multitude of minicomputers, switches, and interfacing devices to organize the lines into a nationwide network.

One of the techniques that these specialized common carriers use is called packet switching. Packet switching allows a message to be broken down into groups of bits and distributed throughout the network. A message, therefore, consists of several groups of bits or packets. These packets, unlike the messages sent through a telephone switching center, go off in all directions. An entire message does not travel together; and at its final destination, the packets are all gathered together, and the message is reconstructed. This is a good way to prevent eavesdropping. Baseband transmission operates on the principle of packet switching.

Several other services are available through wide-area networks, such as EasyLink (electronic mail, message and voice systems), FAXPAX-ITT (facsimile network), MCI Mail-MCI (computer-based message system-CBMS), ROLM-Rolm Corporation (computer-based voice communications-CBVC), VMX, Inc. (computer-based voice communications), and WINC-Worldwide Integrated Communications Service from Mohawk (CBMS).

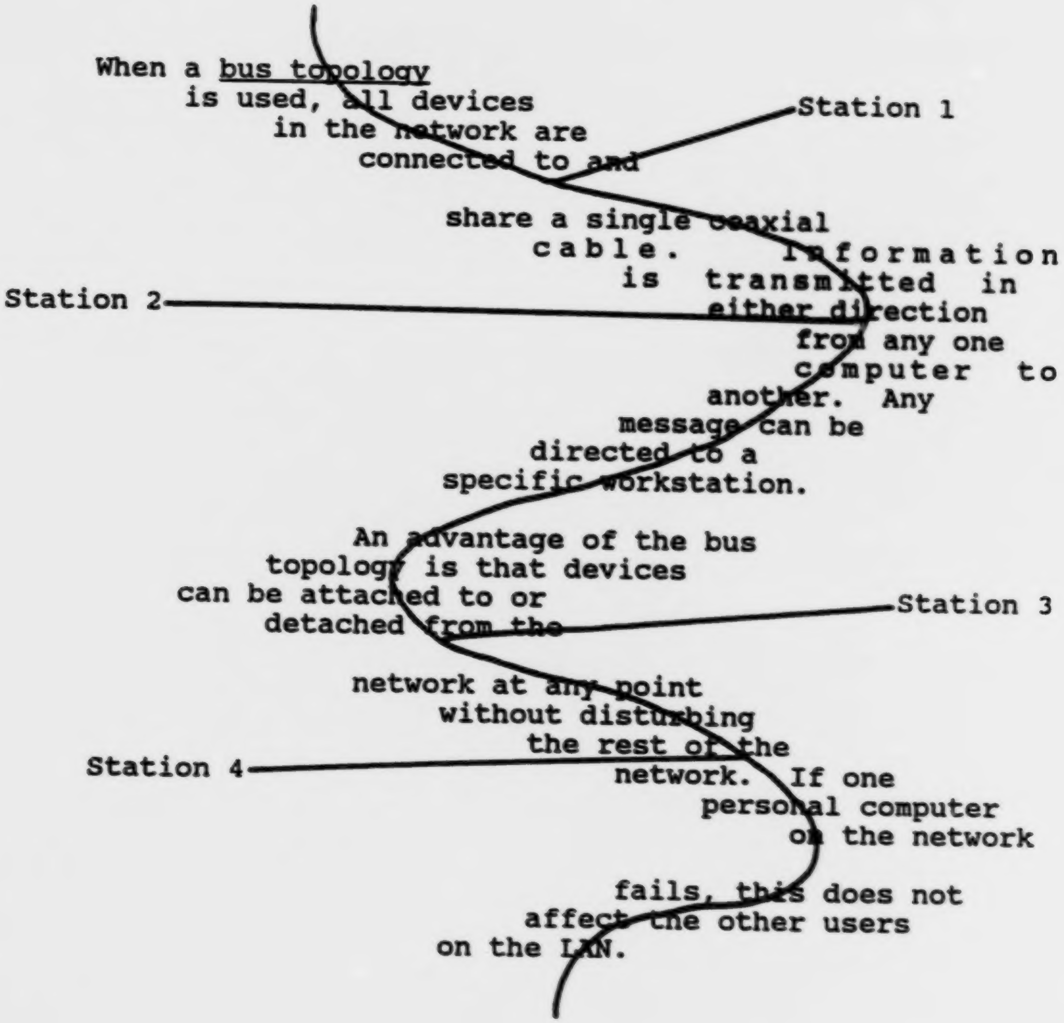
A local area network (LAN) covers a limited geographic area, is privately owned and user administered, is used mostly for the internal transfer of information within a business, is normally contained within a single building or adjacent group of buildings, and transmits data at a very rapid speed. A variety of office equipment may be connected into a LAN, such as word processing equipment, computer terminals, video equipment, personal computers, printers, file servers, mainframes, minicomputers, and others. The three most important applications of LANs include:

> Hardware resource sharing places certain expensive devices on the network to allow each personal computer on the network to use that device, such as laser printers, letter quality printers, file servers, and others. Rather than have a printer for each personal computer, users can share a single piece of hardware.
>
> Information resource sharing allows personal computer users on the LAN to access data stored on any other computer in the network. In actual practice, hardware resource sharing and information resource sharing are often combined. Also, frequently used software is another type of resource that is often shared on a LAN. Word processing, database, or other software can be stored on a hard disk and accessed by all users as needed. When purchasing this type of software, it is critical to be sure that this kind of access is permitted by the software company.
>
> Electronic mail or electronic text transfer provides the ability to communicate directly with other users of the LAN. A user can use the communication network to send a message using electronic mail, to receive a message, and to print the message.

NETWORK TOPOLOGY

The equipment in a LAN is usually tied together in some kind of configuration or pattern, called a topology. The topology describes the pathway by which the devices on the network are connected to each other. There are three widely used topologies, bus, ring, and star, as follows:

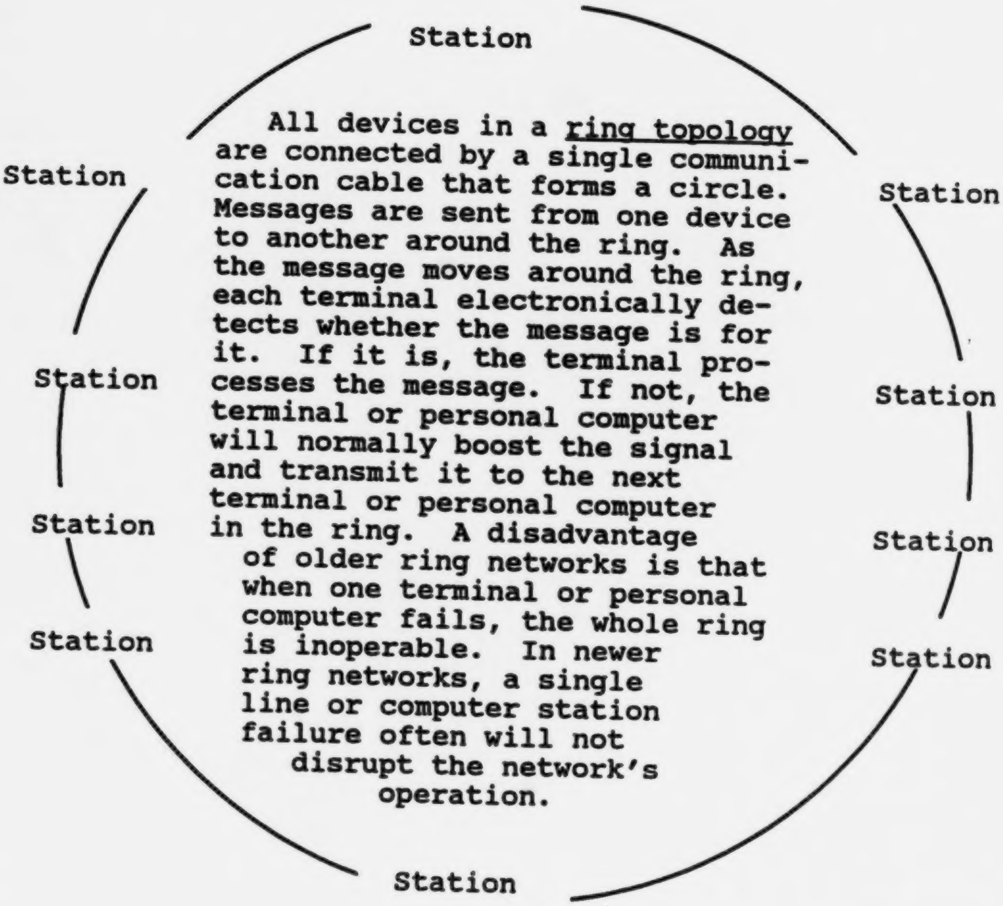
BUS TOPOLOGY



When a bus topology is used, all devices in the network are connected to and share a single coaxial cable. Information is transmitted in either direction from any one computer to another. Any message can be directed to a specific workstation.

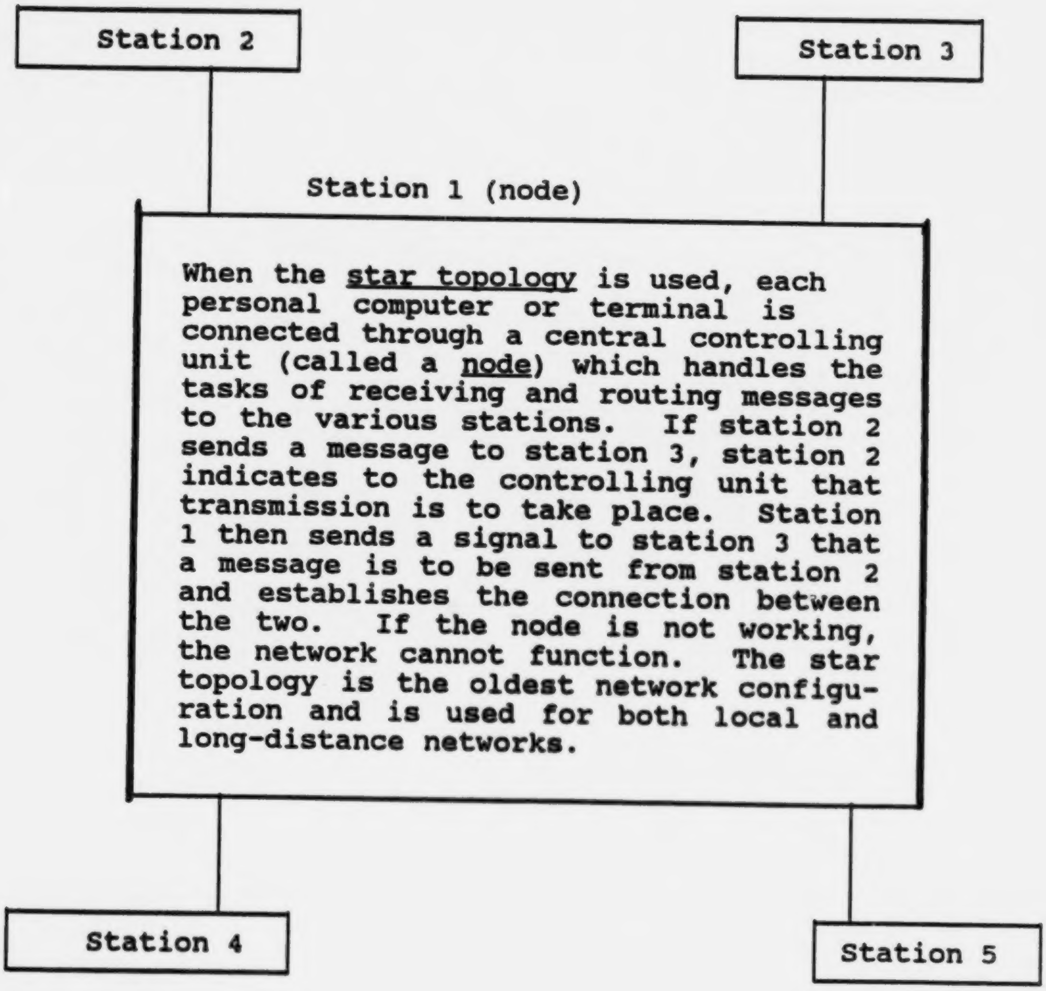
An advantage of the bus topology is that devices can be attached to or detached from the network at any point without disturbing the rest of the network. If one personal computer on the network fails, this does not affect the other users on the LAN.

RING TOPOLOGY


Station
Station
Station
Station
Station
Station
Station
Station
Station
Station

All devices in a ring topology are connected by a single communication cable that forms a circle. Messages are sent from one device to another around the ring. As the message moves around the ring, each terminal electronically detects whether the message is for it. If it is, the terminal processes the message. If not, the terminal or personal computer will normally boost the signal and transmit it to the next terminal or personal computer in the ring. A disadvantage of older ring networks is that when one terminal or personal computer fails, the whole ring is inoperable. In newer ring networks, a single line or computer station failure often will not disrupt the network's operation.

STAR TOPOLOGY



When the star topology is used, each personal computer or terminal is connected through a central controlling unit (called a node) which handles the tasks of receiving and routing messages to the various stations. If station 2 sends a message to station 3, station 2 indicates to the controlling unit that transmission is to take place. Station 1 then sends a signal to station 3 that a message is to be sent from station 2 and establishes the connection between the two. If the node is not working, the network cannot function. The star topology is the oldest network configuration and is used for both local and long-distance networks.

NETWORK ACCESS is accomplished when designing the network by deciding how the various devices will gain access to the network to transmit and receive messages. The most common access methods are polling, contention, and token passing.

Polling is the method whereby the central controller goes around the network in order, asking each terminal if it wishes to transmit. Polling is used primarily with star topology.

Bus topology uses contention as the most common access method. The contention is that each device has access to the network when the network is not busy, much like a telephone party line. When a terminal has data to send, it first electronically listens to the network communication channel to determine if any other terminal or computer is transmitting data. If transmission is taking place, the terminal waits a short period of time (milliseconds) and again listens to the line. This process continues until the terminal finds the line free; then it transmits its message.

Several contention methods are used with LANs. The most common is carrier sense multiple access (CSMA). CSMA utilizes two methods to ensure that devices do not transmit messages at the same time. This phenomenon is called a collision. When this occurs, neither terminal can transmit data. They wait a random short period of time (each waiting a different amount of time) and then attempt the transmission again. Systems which operate in this manner are called CSMA/CD (collision detection). Another method used with CSMA to prevent devices from transmitting messages at the same time is collision avoidance (CA). With CSMA/CA, special electronics in the networks guarantee that only one device can transmit at a time.

Token passing can be used in bus or ring networks. A token is a string of bits that constantly travels around the network. The string of bits contains a source, room for a data message, and a destination address. Any terminal or personal computer which wishes to transmit data must wait until it receives the token from the previous station in the network. When the station receives the token (giving it permission to transmit), it transmits its data and then passes the token to the next station. Each terminal also looks at the address in the token to see if the message is for it. If it is not, the token is passed along the network until it gets to its destination. Because only one token exists in the network at a time, only one computer can use the network at a time. The IBM PC network is a token ring network.

NETWORK SERVERS

Several devices are often needed in a network in addition to terminals or personal computers. Some of these additional equipment include:

A file server controls the access of users to information stored on a hard disk. It locks up a record that is being accessed by one user so others cannot access it at the same time. If many people were to access and change a record simultaneously, many of the changes might be lost. A file server also may be responsible for establishing private areas for each user by keeping track of passwords.

A printer server allows the output from a particular terminal or personal computer to be directed to the appropriate output device.

A gateway device may be needed to perform the necessary protocol translations when LANs are connected to mainframe computers or to communication networks outside of a specific LAN.

A bridge is an interface device that allows two similar LANs (same model/type/manufacturer) to communicate.

A utility server is needed to allow access to special devices, such as modems, which are attached to the LAN and are not handled by any other server on the network.

PROTOCOL

The term protocol describes the rules established to govern the sending of information from one piece of equipment to another. Devices at either end must be compatible; i.e., they must be able to accept and send data. Protocol involves exchanging a predetermined sequence of signals when the connection is first established between two types of equipment to determine if they are matched according to transmission technique, transmission rate, error-checking, codes used to store data, direction of transmission, and readiness to accept or transmit a message. This exchange of signals sometimes is called handshaking.

COMPATIBILITY

Compatibility. Special considerations must be observed in telecommunications in order to effect transmission of data and ensure compatibility. Two pieces of equipment must be able to send and receive information to and from each other. Factors which must be taken into account include speed, amount of information which can be transmitted, mode of transmission (asynchronous and synchronous), protocols, and codes in which bits are placed in traveling along the line.

While it may be possible for two computers with incompatible codes to communicate, the results may not be satisfactory. Connectibility is the ability to receive information that has been sent. The system may receive keyboarded numbers, symbols, and letters, but cannot communicate margin settings, paragraph indentions, and other format instructions to the receiving system. The person at the receiving end must reinsert these instructions. From the designer's point of view, high priority is given to compatibility.

Editability describes the ability to receive information in the format in which it was sent. True compatibility does not exist unless the communication has editability.

Planning Considerations. Generally, a user does not rush right out and "buy a LAN." A LAN is a semi-customized package made up of cables, transmission devices, interface units, network management hardware and software, end-user devices and applications software, and other components. The user must take into consideration the following questions:

> Is a LAN really needed?
>
> What type of information will be transported by this network? Will it be data only, or will voice and video communications also have to be accommodated?
>
> What types of and how many devices are to be interconnected? Will the connections be point-to-point or will switching need to be accommodated?
>
> What are the status and characteristics of the physical environment in which the LAN will be employed? Does the physical environment have any special requirements or problems? How great are the geographical distances that need to be covered? Is there existing wiring, ductwork, or other facilities already in place?
>
> What traffic volume is expected on the network? What level of performance and throughput is required? What are the maximum user data rates to be supported?
>
> Will multiple devices have to be able to access the network concurrently?
>
> What length of response time and access time delays can be tolerated? Must the network guarantee access to some or all users?

Will the local network be interconnected to any other type of network, either public (such as Tymnet or Telenet) or private network?

What services will the network be required to perform for current applications, and for applications which may evolve in the future? Can any other host system in the network share some of the responsibility for network services?

What level of reliability is required for transmission, user devices, nodes, links, and for the network as a whole? What level of transmission error control must be supported by the network? How quickly and predictably must the network be able to recover from node or link failure?

How easily must the network be able to accommodate expansion and other types of configurational changes? What kinds of growth/changes are expected? Additional nodes? New types of traffic? Changes in existing traffic types or volume? Movement of user equipment from one work area to another?

How easy must the network maintenance be? What price, in terms of both money and downtime, can be afforded to pay for network maintenance? Will the user need (or be willing to add) experienced network maintenance personnel to the staff?

What are the financial limitations?

<ins>SUMMARY</ins>: This discussion of the professional workstation has focused on its various elements: (1) computers: displays, CPU, keyboards; (2) storage/retrieval (recording media): paper tape, magnetic tape, magnetic cards, floppy disks, hard disks, RAM disks, bubble memory, holography, and optical disks; (3) peripherals: printers, plotters, phototypesetters, scanners, image processors; and (4) telecommunications: modems, electronic message systems, communicating word/information processors, teleconferencing, FAX, and networks. The purpose of this discussion has been to point out that the breadth and depth of capabilities which this equipment provides to the individual worker in the automated office is astounding. Experts agree that capabilities of the professional workstation will continue to expand, especially in the area of telecommunications.

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COMPUTER BUSINESS APPLICATIONS II

Task Area 2

Given a choice of software applications from the following list: communications (including E-Mail, telecommunications), network management, records management, desktop management, desktop publishing, decision support, integrated, accounting, or other available software, the **student will be able to define terms, identify the structures and formats of the chosen software and produce documents which demonstrate an operational knowledge in setting up, formatting, and manipulating the software** **to the satisfaction of the instructor**.

Suggested teaching strategies:

(1) Initial lecture/discussion to create awareness that software is available for specific applications, and to define terms, concepts, and formats which are common to these software applications in the automated office, as well as identifying new terminology and concepts.

(2) Hands-on operational knowledge pertinent to the software that is available in the classroom (or through other sources) is required. Applications for networking (host to PC exchange) is vital.

(3) To enhance awareness and familiarity with a variety of software, oral and written presentations by students to present purpose, scope, and limitations of various software applications is strongly encouraged. Project teams should be formed to enhance interpersonal skills.

PART 1

At the end of Task Area 2, the student will be aware of computer software terminology, concepts, and vocabulary. In addition, an awareness of the kinds of software which are available and the trends in computer software is developed.

A computer is governed by its software. Without applications software, computers could not perform specific operations. The potential of the computer hardware is not realized until applications software is put into it.

The software industry is experiencing a phenomenal rate of growth and business analysts predict a 75 percent increase in the size of this industry by 1990 (Bergerud and Keller, 1988). One can see this in the amount of software that is now available to computer users. This is a field to watch, however, since the development of future software is moving toward more powerful integrated software applications which will take advantage of more powerful hardware, simplified programming for easier software and program development and in the application of artificial intelligence concepts. Also, growth will occur in software that uses natural language commands and in the development of expert systems.

As implied by its name, natural language software utilizes commands which come close to duplicating communication language between human beings. For example, software novels have begun to appear in which the reader can influence the action by making choices in natural language. In this way, the novel is different each time it is read.

Expert systems software can use human-like reasoning skills to solve problems. The few expert systems which are available now work with only specific bodies of information. For example, an expert system used by a major computer manufacturer can advise exactly what combination of memory, cables, storage mechanisms, and other parts must go into a minicomputer to meet a customer's expressed needs. However, when it comes to other bodies of information, the system is completely ignorant.

Another software development to watch is firmware program chips. Some manufacturers have begun to develop their software on ROM chips instead of on disks. Several factors have influenced this decision. Chips cannot be as easily copied as disks can be, thus counteracting software piracy. Also, access to programs stored on chips is faster since the chip is built into the microcomputer (thus, its name--firmware). A future scenario may have computer users inserting and removing chips as easily now as they do floppy disks.

End users in the automated office are realizing the need for increasingly sophisticated software applications and hardware configurations to meet today's business demands for increased productivity and for more information for effective decision making. The more familiar and comfortable people become with automated equipment, the more they are asking and demanding:

> Why isn't software available that can accomplish more of the repetitive, monotonous tasks in an office? We need software to do more than just provide the means to create and edit written documents; we need to be able to research, create forms, set up calendars and meetings, plan and organize projects, communicate in-house and out of house, leave messages to avoid 'telephone tag',

publish in-house reports, and many more things.

Software developers are listening to these questions and demands. Software now is available which will do most of the things mentioned above--and more. However, when it comes time to purchase software for business purposes, it is usually on a "need to have" basis. That is, it meets a stated requirement or solves a specific problem versus software that is "nice to have" or "fun to play with" just because it is available. Awareness of the broad range of software that is available serves to point out the dilemma in which many people in business find themselves when it comes to selecting the right software for their purposes.

An amazing amount of software is becoming more readily available and workable for many different office applications. In addition, it is important to realize that the best software is not always available or affordable. Therefore, companies have to compromise when it comes to selecting and buying software and hardware.

Software is available today which can perform many business functions--from writing letters (word processing) to preparing a payroll (spreadsheet) to communicating around the world (communications). These software programs can be used by any level in an organization from managers to professional support personnel. For this reason, these programs are called general-purpose software.

Special-purpose software also exists: accounting, project management, desktop publishing, inventory control, as well as software for airline reservations, real estate management, doctors' information programs, insurance records management, and others.

Enhancement applications software has been created to improve the performance, convenience, and versatility of some of the more popular applications software packages. The enhancements range from programs that organize work more productively to report structuring and formatting. Another name for these programs is utilities because they provide useful support for other software programs. The types of utility programs which fall into this category are desktop management, outliners, dictionaries and thesauruses, spelling and grammar checkers, and printing enhancements (drivers and packages which print sideways). This area of software development seems to be experiencing a great deal of growth at the present time.

One other type of applications software is called systems software. Systems software does not perform specific business operations but it enables the computer system to perform those operations more efficiently. An operating system of a computer enables the computer to obey the applications software commands. It generally operates between the applications software and the computer hardware itself. Many times it is transparent to the computer user--that is the end user is not aware of what it can do.

A common task of microcomputer operating systems is working with the disk drives. Therefore, DOS, or disk operating system, handles most of the commands which are asked of the applications software (such as reading a file from a disk or saving work to a disk) as well as checking the components and attachments to be sure they are working properly.

There are many families of operating systems on a microcomputer: MS-DOS, developed by Microsoft; Unix, developed by AT&T for large computer operating systems but is being used by microcomputers to work directly with large computers; OS-2, developed by IBM; ProDos, developed by Apple Computer; CP/M, developed by Digital Research; and others. Large computers also have their own operating systems which generally handle input from many people at the same time.

These and the general-purpose software packages also are called over-the-counter software--they can be purchased as commercial software packages. Many experts feel that the applications software packages available today do not begin to use the capabilities of today's large computer systems. Future software development may begin to take advantage of these capabilities.

Even though there are a large number of software packages available on the market today, there are common features, concepts, and terminology which many software packages share: menus, formats, storage, printer interfaces, fonts, columns, rows, calculations, forecasting tools, outlining, footnoting, thesaurus/dictionary, integration of graphics, ASCII, EBCDIC, database management, and others. Many software packages are "add-ons" to other popular packages, such as dBase, Lotus 1-2-3, Appleworks, SuperCalc. [Add-on software packages add new features to already-established software packages to extend their capabilities. For example, one add-on program, Wisard Forecaster, is a Lotus 1-2-3 add-on which runs four forecasts and combines them for a final forecast.] Many of these software packages also share common key functions in order to perform tasks such as printing, deleting, copying, moving, etc. Familiarity with one word processing or spreadsheet program makes learning another word processing or spreadsheet software package easier and less stressful for the end user.

However, special purpose software packages may include new terminology but use menus, commands, report and printing structures, calculation capabilities, and text editing features which are familiar to the computer user. The new vocabulary may include terms such as: page composition, mechanical, windows, import/export, automatic index, public domain, notepad, envelope addresser, CGA, EGA, Hercules modes, clock, token ring, plug-in card, topology, LAN, hypertext, proprietary software, and others. Familiarity and experience with a wide variety of software packages enhances skills and takes away the fear of the unknown. Knowing the right questions to ask is the product of experience.

(Note to instructor: A list of new, available software is included in the "References" section for your use. Your presentation may include this or a similar list of new software from the latest edition of any computing magazine or software sales catalogs. For example, a publication that is available and free to "qualified subscribers" is entitled Business Software Applications. Publications of this type offer insights and reviews on a whole range of applications software packages.

Bring copies of computing magazines to class and ask students to find advertisements and/or write-ups about various applications software they find in them, especially applications which may be unfamiliar to them.

Required outside readings by students throughout the duration of the course will increase knowledge and awareness in this area. You may want to ask students to create a glossary of terms related to software/hardware. A glossary which defines some of the terms mentioned above is included at the end of this task area.

A suggested class activity includes the identification of industries, businesses, or government agencies which will support field trips for demonstrations of software and hardware or computer vendors who will bring hardware and software into the classroom for demonstration. Types of companies which would use a variety of hardware and software might include: legal firms, records-intensive organizations (hospitals, insurance agencies, government installations, records storage facilities), publishing and/or printing houses, oil & gas (especially multinational companies which use telecommunications), etc.

Resources may be available at your educational institution for field trips which demonstrate automation of information systems; i.e., computing centers, in-house computing services administrators or designers; students records offices; microcomputer centers; etc.)

SOFTWARE PIRACY

With the widespread use of personal computers, thousands of software packages have been developed. These programs are commonly stored on floppy diskettes and can range in price from a few dollars to well over $600. A serious problem facing the personal computer software industry is what is called software piracy--the illegal duplication of software. It has been estimated that for every one software package sold, four are made illegally. The losses to software manufacturers are running in the hundreds of millions of dollars. An important question and consideration for software developers is how to protect software from being copied illegally. As mentioned above, the development of firmware program chips may help to alleviate this problem.

The primary laws used to protect software are federal copyright laws. Most computer software is protected by copyright laws. To the user this means that making copies of programs and sharing them with friends and co-workers is a violation of federal law. **An article from the March-April 1988 issue of Words is included in the "References" section for your information.** It covers a wide variety of the legal ramifications of computer law.

The important points to be emphasized are: it is NEVER all right to make copies for friends, neighbors, or co-workers; an organization should purchase enough copies of software for its use or acquire a license or site agreement; schools are not exempt from federal laws. Teachers should be a role model for students.

Read the license agreement on the software package which buyers tacitly accept when they open the package for the first time. **(An example of a license agreement is included in the "References" section.)** Users should understand that software manufacturers are not selling the software to buyers. The agreement explicitly states that software manufacturers are licensing the buyer to use the software on only one computer at a time. Therefore, if an individual uses the software on two different machines at the same time, the software license has been violated.

Society is becoming increasingly concerned with the ethics of the information processing profession and with the relationship between ethical behavior and criminal behavior with respect to access to information. Many companies are developing policy statements regarding hardware, software, and information ownership. This issue is not going away and must be dealt with by organizations. Management must make it perfectly clear to employees what is considered to be ethical and unethical behavior. An example of a policy statement is included in the "References" section to share with students.

Federal and state laws are also in place to discourage "hackers" with unauthorized clearance from breaking into private or public data banks using remote terminals by breaking security codes and passwords. Computer crime, as this is called, will continue to receive more attention and more litigation in the future.

Included in the "Student Materials" section is Exercise 2-1 entitled, Attitude Test Regarding Ethics of Information Processing. Ask students to take the test and be able to justify each answer. The purpose of this exercise is to create students' awareness of the issues of ethics, criminal behavior, and their responsibility in these issues.

SUMMARY OF PART 1: An abundance of applications software programs is available for today's business demands. This software can be classified as general-purpose software, special-purpose software, enhancement applications or utilities software, and systems software. Most of these kinds of software can be purchased commercially. Future trends in software development will focus on natural language software, simplifying programming, expert systems, and integrated applications. One additional thought to keep in mind is that today's software is not the answer to tomorrow's office problems. This realization is bound to have an impact on the evolution of new applications software from the end users' standpoint.

Software piracy and computer crime are being controlled through the application of federal and state laws. All end users of hardware and software are subject to these laws. A good, sound articulated ethical philosophy toward these issues is mandatory in today's world.

PART 2

At the end of Task Area 2, the student will be able to demonstrate operational knowledge of three (3) software applications packages. Software packages which relate to communications, desktop publishing, desktop management, records management, or new-to-the-student word processing, spreadsheet, database management, or graphics packages are suitable. New applications for familiar software also may be appropriate.

Students will turn in their work for evaluation to the satisfaction of the instructor. Specifically, students should become familiar with the following commands/functions in the chosen software through the use of appropriate exercises, demonstrations, tutorials, or other materials.

WORD PROCESSING

Start up and prepare a computer system, dedicated word processor, or other configuration for preparation of documents. Set up backup function (if applicable to software).

Complete the software tutorial or learning disk and/or basic training guide (if appropriate). The following elements of the information processing cycle should be demonstrated:

Input

Create a variety of documents using the software. Documents include letters, memos, and reports.

Create documents which require the use of merging a variable list or stored paragraphs in personalized correspondence.

Proofread documents on the video display screen and on hard copy.

Process

Process documents to revise, edit, reformat, and proofread documents. Specific commands should include insert, delete, overstrike, copy, move, global search and replace, cursor movement, reformatting margins, line spacing, tabs, hyphenation, pagination, justification, centering, embedding codes (if applicable), and adding headers and/or footers as appropriate. Import/export information from/to another word processing package; edit, revise, reformat as necessary to create the document. Use an electronic spell checker, grammar checker, or dictionary or thesaurus to check documents prior to output or distribution.

Store/Retrieve

Store documents on recording media: floppy diskette, hard disk, cassette tape, optical disk, or other media.

Recall previously stored documents to make editing or formatting changes based on proofreader's marks or to make corrections. Create a new document and use the electronic spell checker, grammar checker, dictionary, or thesaurus to check the new document.

Output

Use software and hardware commands to print a document from the screen, from the directory or catalog, or from the storage media. Manipulate the printer codes in the software or printer to change font size, change font styles within a document, print more than one copy of a document, print one certain page at a time, and cancel the printing of a document.

Distribute

Determine the best method of disseminating the documents based on a set of parameters, such as:

(1) normal distribution of information to persons inside and outside the organization;
(2) overnight delivery of document;
(3) delivery of document (called for at 9:00 a.m.) to manager in another city who needs it by 12 Noon for a meeting at 1:00 p.m.;
(4) delivery of information to employee in another department who has come in person;
(5) delivery of copy of document to manager overseas;
(6) delivery of information to employee in another department who has called;
(7) delivery of information from one colleague to another colleague who is out of the office but needs the information when he/she returns;
(8) how to use facsimile, modems, or other information distribution devices which may be available in the classroom to send documents.

The student also will be able to demonstrate decision making skills related to the following:

(1) set priorities for the tasks to be completed.
(2) use reference documentation for software and hardware in the classroom, as needed.
(3) format and edit documents and subsequent changes.
(4) analyze equipment problems and diagnostic troubleshooting.
(5) load and/or change paper and ribbons (or toner) on printer.
(6) evaluate work to be turned in for mailability: proofread, correct English, and correct formatting errors.
(7) show how to store and handle magnetic media, as well as how to power down electronic equipment.

(8) recognize and explain the similarities/differences and strengths/weaknesses between two word processing software packages.

SPREADSHEET

Start up and prepare a computer system, dedicated word processor, or other system configuration for preparation of documents. Set up backup function (if applicable to software).

Complete the software tutorial or learning disk and/or basic training guide (if appropriate). The following elements of the information processing cycle should be demonstrated:

Input

Explain the structure of a spreadsheet consisting of columns, row, cells, and templates.

Identify, label, and use the parts of a spreadsheet, including rows, columns, and cells.

Identify and define cells using an appropriate cell format (general, currency, percentage, and integer) with labels, values, formulas, and functions.

Create or open and name a template file.

Key (with appropriate technique and acknowledging proofreader's marks) the labels, values, formulas, and functions of spreadsheets from typewritten copy.

Process

Select and use the appropriate basic editing functions of insert, delete, move, copy (replicate), search and find, and replace.

Use the following editing techniques: clear the spreadsheet, blank cells, escape, access menus/commands, edit, and/or rekey cell definitions.

Execute the following formatting techniques on a single cell or throughout the entire spreadsheet: change column width, do automatic or manual recalculations, justify labels or values, set decimal positions, insert or move rows and columns, freeze or unfreeze horizontal and/or vertical titles, create split viewing area on the screen (window), and replicate cell definitions from one location to another in the spreadsheet as either a relative or absolute replication.

Explain and apply range and block actions.

Explain the need to replace a report heading on the template which includes title, source, and creation date.

Store/Retrieve

Name (if not already named) a document according to the parameters of the software.

Store (save) a document on the formatted/initialized floppy disk for future reference.

Use the backup command on the software for storing (saving) documents after a specific time period OR demonstrate the value of storing (saving) documents by saving periodically.

Recall previously stored documents to make editing or formatting changes (such as global search and replace), to make proofreader's changes, and to make reformatting changes.

Recall previously stored documents to apply forecasting data for creating a new document.

Output

Use software commands to create the report format which will be printed.

Use software commands to print a document from the video screen.

Use software commands to print a document from the directory or catalog.

Print the directory or catalog listing of documents stored on the floppy disk.

Manipulate the printer or the printing commands in the software to: change font size, change font styles within the document, print more than one copy of a document, print one page at a time, and cancel the printing of a document.

If using integrating software, use software commands to integrate the spreadsheet data to a word processing or another spreadsheet document. This includes setting up the report format, eliminating unwanted and unneeded data from the spreadsheet, and transferring the newly created document to the word processing or spreadsheet document. If it is possible with the software available, transfer spreadsheet information to a database document.

Distribute

Determine the best method of disseminating the information created for the following situations:

(1) normal distribution of information to persons inside and outside the organization;
(2) overnight delivery of document;
(3) delivery of document (called for at 9:00 a.m.) to manager in another city who needs it by 12 Noon for a meeting at 1:00 p.m.;
(4) delivery of information to employee in another department who has come in person;
(5) delivery of copy of document to manager overseas;
(6) delivery of information to employee in another department who has called;
(7) delivery of information from one colleague to another colleague who is out of the office but needs the information when he/she returns;
(8) how to use facsimile, modems, or other information distribution devices which may be available in the classroom to send documents.

The student also will be able to demonstrate decision making skills related to the following:

(1) set priorities for the tasks to be completed.
(2) use reference documentation for software and hardware in the classroom, as needed.
(3) format and edit documents and subsequent changes.
(4) analyze equipment problems and diagnostic troubleshooting.
(5) load and/or change paper and ribbons (or toner) on printer.
(6) evaluate work to be turned in for mailability: proofread, correct English, and correct formatting errors.
(7) show how to store and handle magnetic media, as well as how to power down electronic equipment.
(8) recognize and explain the similarities/differences and strengths/weaknesses between two spreadsheet software packages.

DATABASE MANAGEMENT

Start up and prepare a computer system, dedicated word processor, or other system configuration for preparation of documents. Set up backup function (if applicable to software).

Complete the software tutorial or learning disk and/or basic training guide (if appropriate). The following elements of the information processing cycle should be demonstrated:

Input

Explain the structure of a database management file.

Identify, label, and use the structure of a database, including fields, records, files, and the database.

Create, open, and name a database file.

Enter (with the proper technique) field names, field entries, commands, and report headings.

Access and use commercially prepared databases.

Process

Create and format database reports.

Design and enter the database entry form.

Select and use basic editing functions to change data, including: insert, delete, move, copy, search and find, and replace.

Select and use the appropriate editing mode, such as overstrike and insert.

Modify the field or record of file structure by adding or deleting fields or changing the order of fields.

Sort data in order according to: alphabetical, numerical, chronological, ascending, descending, and multiple format.

Store/Retrieve

Name (if not already named) a document according to the parameters of the software.

Store (save) a document on the formatted/initialized floppy disk for future reference.

Use the backup command on the software for storing (saving) documents after a specific time period. OR Demonstrate the value of storing (saving) documents by saving periodically.

Recall previously stored documents to make editing or formatting changes (such as global search and replace) based on proofreader's marks and/or to reformat field names and layout. Recall previously stored documents to apply sorting routines for creating new documents with current data or to insert, delete, or recalculate records in the file.

Output

Use software commands to print a document from the video screen.

Use software commands to print a document from the directory or catalog.

Print the directory or catalog listing of documents stored on the floppy disk.

Manipulate the printer or the printing commands in the software to: change font size, change font styles within the document, print more than one copy of a document, print one page at a time, and cancel the printing of a document.

If using integrated software, use software commands to integrate the database file to a word processing or another database document. This includes setting up the report format, eliminating unwanted and unneeded data from the database, and transferring the newly created document to the word processing or database document. If it is possible with the software available, transfer database information to a spreadsheet document.

Distribute

Determine the best method of disseminating the information created for the following situations:

(1) normal distribution of information to persons inside and outside the organization;
(2) overnight delivery of document;
(3) delivery of document (called for at 9:00 a.m.) to manager in another city who needs it by 12 Noon for a meeting at 1:00 p.m.;
(4) delivery of information to employee in another department who has come in person;
(5) delivery of copy of document to manager overseas;
(6) delivery of information to employee in another department who has called;
(7) delivery of information from one colleague to another colleague who is out of the office but needs the information when he/she returns;
(8) how to use facsimile, modems, or other

information distribution devices which may be available in the classroom to send documents.

The student also will be able to demonstrate decision making skills related to the following:

(1) set priorities for the tasks to be completed.
(2) use reference documentation for software and hardware in the classroom, as needed.
(3) format and edit documents and subsequent changes.
(4) analyze equipment problems and diagnostic troubleshooting.
(5) load and/or change paper and ribbons (or toner) on printer.
(6) evaluate work to be turned in for mailability: proofread, correct English, and correct formatting errors.
(7) show how to store and handle magnetic media, as well as how to power down electronic equipment.

GRAPHICS

Start up and prepare a computer system, dedicated word processor, or other system configuration for preparation of documents. Set up backup function (if applicable to software).

Complete exercises on software learning disk and/or software training manual.

Identify and describe various types of charts (line, bar, pie, stacked, etc.) and the advantages and disadvantages of using graphics to represent data.

Apply specific instructions for a given graphics software package to practice exercises to CREATE, PLOT, SAVE, and PRINT.

(Note to instructor: Accounting textbooks and business mathematics textbooks are good sources of exercises in practicing graphics charts.)

If using an integrated software package, transfer graphics to another application, such as word processing or spreadsheet. OR Transfer data from another software application without rekeying data and create graphics to represent the data.

The student also will be able to demonstrate decision making skills related to the following:

(1) set priorities for the tasks to be completed.
(2) use reference documentation for software and hardware in the classroom, as needed.
(3) format and edit documents and subsequent changes.
(4) analyze equipment problems and diagnostic troubleshooting.
(5) load and/or change paper and ribbons (or toner) on printer.
(6) evaluate work to be turned in for mailability: proofread, correct English, and correct formatting errors.
(7) show how to store and handle magnetic media, as well as how to power down electronic equipment.

INTEGRATED

Integrated applications software packages are designed to include different applications programs, usually word processing, spreadsheet, database management, and graphics working together and sharing commands or data all on one software package. The functions and commands mentioned above for word processing, spreadsheet, database management, and graphics should be used as the basis for operational knowledge of each of these functions in the integrated applications software package.

In addition, the following objectives should be added in order to achieve the feel for the "integration" of the functions, using the software in the classroom:

(1) Merge two word processing documents.
(2) Merge two database management documents.
(3) Merge a database management document with a word processing document.
(4) Merge two spreadsheets.
(5) Merge a spreadsheet document with a word processing document.
(6) Merge portions of a database management document with a word processing document.
(7) Merge portions of a spreadsheet document with a word processing document.
(8) Use a spreadsheet to create a graphic.
(9) Integrate a graph with a word processing document.
(10) Integrate a spreadsheet and graph into a word processing document.

COMMUNICATIONS

Electronic Mail (E-Mail)

Electronic mail is the delivery of documents through electronic means. Instead of using the U. S. Post Office, a private postal service, or the telephone, communication is accomplished with the use of communication software, a modem, and some type of transmission media (LAN, telephone lines, cable, microwave, or and/or satellite). In this way, messages can be sent, received, and stored for future use.

An electronic message can be sent on a word processor, microcomputer, minicomputer, or a mainframe computer and sent to another terminal or terminals 24 hours a day. Examples of electronic mail are accepting overnight orders on a microcomputer, local area networks within an office, worldwide private communications network linking thousands of employees, and subscription to a private service databank (such as CompuServe, The Source, Dow Jones, OnTyme, or Tymnet).

A typical E-Mail message may look like the one below:

```
>mail

Send, Read, or Scan:  Read

From:  D. Smith     Posted:  Thu 28-Jul 14:22 CDT

Subject:  Staff Meeting

Staff meeting on Thursday, August 4, at 10 a.m.
in Room 665.  Purpose of meeting is to discuss
the new security program that the Board decided
upon at its last meeting.  Please plan to be
there.
```

Figure 1.

Advantages of E-Mail include:

(1) avoids 'telephone tag'.
(2) may increase effective group decision making since it avoids face-to-face pressure to conform.
(3) promotes equal and open communication.
(4) saves keying, copying and distribution time.

(5) can be delivered immediately.
(6) is faster than voice communication delivery.
(7) can take advantage of least expensive rates to deliver messages.
(8) is easy to use and requires little training.

Disadvantages of E-Mail include:

(1) initial investment cost in equipment and lines to transfer messages and information.
(2) on-going cost of telephone line charge or subscription service fee.
(3) the longer the message, the more expensive to transmit. E-Mail may not be the best means of transferring lengthy reports.
(4) sender unable to see facial expressions, hear tone of voice, observe posture or other body language. The non-verbal cues may be important in face-to-face meetings which involve bargaining, discipline, and evaluations. Some experts have concluded that E-Mail is inappropriate for these types of communications.
(5) limited feedback to the sender.
(6) LAN system unable to do more than one thing at a time when sending E-Mail. If a person were typing a word processing document and wanted to check the mailbox, he/she would have to leave the word processing document and go to the electronic mailbox to read the mail. Many organizations prefer equipment which can handle multitasks at the same time. Naturally, the cost of equipment which can handle multitasks would be higher.

Arrange for an in-class demonstration of the E-Mail system students will use. OR Arrange a vendor demonstration, if equipment is not available in the classroom.

Examples of electronic mail software packages include but are not limited to: EMail, ECom, Smartcom, CompuServe, MCI Mail. If equipment is not available, use a word processing software package and itemize how you would input, transfer, and output the memo or document. (Note to instructor: Interoffice memos found in word processing applications or keyboarding textbooks are good sources of exercises.)

Each software package will be different; however, these are suggested commands:

To send:

Log on to master system using user name, entry code or password, charge (if appropriate), and department.

Enter command.

Respond to on-line prompts.

Edit entries while keying in message.

Proofread message upon completion.

Log on to local system using name, password, and other entry data.

Recover, if disconnected.

Enter command to send copies of message.

Save message using the proper command.

To receive:

Recover messages, if mail has been sent by checking system. Enter command to summarize messages.

Print all messages. OR Print selected messages.

Enter command to bypass messages, if desired.

Enter command to send a message, entering a second message to specify time limit of message.

Read messages.

Forward messages using existing messages.

Purge a message from the system.

Use search command to find a particular message.

Request notification of delivery when receiver has accessed E-Mail system.

Using proper commands and logoff procedures, sign off system.

(Note to instructor: An example of E-Mail commands using a VAX system are included in the "References" section for your information.)

Bulletin Boards

Bulletin boards are similar to electronic mailboxes. However, they allow open access. When a bulletin board is accessed through a modem, messages that have been left there by prior callers can be read and, in turn, messages can be left.

Bulletin boards are used internally by businesses to pass along information which pertains to all employees.

Set up a bulletin board in the classroom so students can gain experience with electronic communications.

Network Management

Network management skills are vital to the information systems worker. Therefore, in addition to acquiring hands-on operational knowledge of the applications software above, students should be given the opportunity to develop networking skills--that is, host to PC exchange for downloading or uploading of data. These skills can be developed through classroom, departmental or college bulletin boards (if there is a microcomputer hooked into the mainframe); electronic mail simulations; computer-based mail services; telecommunications simulations (such as Information Manager by MECC); or other system configurations which may be available. The importance of skill development in this area cannot be overemphasized.

Suggestions for setting up hands-on electronic communication experience:

1. Ideally, a workstation with a modem which provides full access to E-Mail or other electronic communications capability is preferred.
2. If there is a workstation in the classroom or lab attached to the college system, arrange for a demonstration of how to access the system and use the system for electronic communication. Arrange to access and utilize the college bulletin board, if there is one available.
3. Within the classroom or lab itself, a single microcomputer could be attached to one or two microcomputers with a null cable from one serial port of one microcomputer to the serial port of other microcomputers to set up a host and workstations/slaves to demonstrate electronic communications. To demonstrate and facilitate use, put students' assignments or class announcements on the system. Ask students to respond to the assignment or message. Set up an electronic exchange of files by students.

4. **Purchased time on a commercial system, such as CompuServe, The Source, Dow Jones News/Retrieval, or a local videotex system, may be made available to students for a specific period of time for hands-on electronic communications. A lab fee to pay for the purchased time may have to be assessed.**

   Many college libraries do on-line computer searches, using commercial systems. If this is available at your institution, you may be able to set up a demonstration for the class.

5. **Computer users' groups on a local and a national basis also use bulletin boards to communicate ideas, solve problems, pass along ideas, and keep in touch with other computer users. Bulletin boards use roughly the same sort of log on procedures, passwords, and commands to access them. If a bulletin board is set up and used, remember that everyone using it has access to the message.**

****

Any on-line exchange should demonstrate capabilities of the system, any potential problems, the need for backup, and "weaning" from paper.

****

6. **A videotape is available entitled, LOCAL AREA NETWORKS, Part I and II, from Institute for Advanced Technology, 6003 Executive Boulevard, Rockville, Maryland 20852.**

7. **A slide/tape presentation on ELECTRONIC MAIL is available from Milady Publishing.**

8. **PC WORLD is another good source of articles on electronic messaging, electronic mail, etc.**

9. **Arrange a demonstration of a facsimile machine sending and receiving documents.**

DESKTOP PUBLISHING

Desktop publishing software enables users to combine text and graphics to produce flyers, reports, newsletters, catalogs, and other printed documents of nearly the same quality as professional print shops. Desktop publishing is defined as using a microcomputer, the appropriate software, and a laser printer to produce print shop-like documents. Because many of the decisions which are made to produce these documents resemble those a professional printer would make, desktop publishing programs are also called page composition programs.

(Note to instructor: A copy of the Desktop Publishing Exercise, Exercise 2-2, is included in the "Student Materials" section.)

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CLASSROOM DESKTOP PUBLISHING PROJECT

The class will produce a one-time newsletter for the department. In order to produce the newsletter, certain steps must be taken:

1. Assemble the information for the newsletter. This is the "copy".

2. Assemble the photographs and graphics for the newsletter.

3. After the text and graphics have been collected, draw a rough layout or diagram of the newsletter, answering the following questions:

   (a) How many columns of type on each page?
   (b) Will the columns be justified on one side or both sides?
   (c) Will vertical or horizontal lines be used to separate items?
   (d) What size type or font will be used for copy? for headlines? for fillers? under photographs?

4. After these decisions are made, load the appropriate desktop publishing software. (If page composition software is not available, word processing software can be substituted to enter the text and pictures can be pasted on the page and then printed and copied on a copy machine.)

   With desktop publishing software, the decisions which were made above can be built right on the computer screen, including photos and graphics. The page as originally laid out can be seen on the screen. Changes can be made regarding font size, size of photos or graphics, width and number of columns, etc. One set of commands will move a graphic from the top of a page to the bottom, another will wrap text around it, another will relocate text from one page to another, and so on. The resulting page layout is called a mechanical which is used to print as many copies as needed. Normally, documents created with desktop publishing software are printed on a laser printer. However, if a large number of documents is needed, the printout of the mechanical can be used for reproduction at a print shop or on a high-speed copier. If only a few copies are needed, all the copies can be made on the laser printer.

Last minute changes can be made easily by recalling the page to the screen, making the alterations, and printing the new version.

5. Distribute the newsletter to the appropriate persons.
6. Hand to the instructor for evaluation.

****

DESKTOP MANAGEMENT OR DESKTOP UTILITY

Desktop management, or desktop accessory, programs allow the computer user to call up a computerized notepad, calculator, appointment calendar, phone number listing and dialer, clock, tickler file, and more while sitting in front of a computer. Many times, these enhancement applications packages are called to the screen while working with other applications programs, such as spreadsheet, database management, or word processing.

****

Calendaring

One of the more common uses of this kind of software is for calendaring. Appointments and messages are noted according to the time of the day, day of the week, week of the month, etc. Some calendars allow a computer user to plan time years in advance. Most will show the month with the dates and days. One keystroke may call the calendar to the screen. Also, it may be printed for easy reference. An example of a computerized calendar is illustrated here:

Aug 4 19--

Title	Administrator
08:30a	Stephen King
09:30a	Dick VanPatten
11:00a	Humphrey Smith
12:00p	Lunch with Susan
12:30p	Lunch with Susan
01:00p	Staff meeting
01:30p	Staff meeting
02:00p	Staff meeting
03:00p	Mark Harmon

Figure 2.

In order to be useful, the calendar must be available at all times; that is, in the background where it can be accessed without rebooting or switching disks. Another important feature of the calendar software is its ability to automatically schedule monthly meetings. For example, if a departmental meeting is always held the last Friday of the month, the calendar software should be able to schedule the meeting for a year in advance, thus saving having to key in the meeting each month. Some desktop management software can keep track of important meetings and alert the user in some way--an alarm or visual indicator on the screen--at a given time.

Some of the uses of this kind of software which have been noted in the literature include:

> A law firm uses the software to print dockets (legal proceedings) for the month and give assignments to attorneys from it.
>
> Managers have used the software to schedule meetings among staff members. If each staff member enters a calendar in the master calendar, the software can search for a date and time when all staff are available to meet.
>
> Many individuals print out weekly calendars to use when away from the office.
>
> More and more people access an on-line calendar through communications while away from the office.
>
> Others?

Examples of software packages available for this purpose include: Sidekick, Timeout Desktools, PROFS, FRIDAY, and others. **A demonstration of the software which will be used in the classroom should focus on the following commands:**

(1) View calendar.
(2) Make calendar entry.
(3) Change calendar entry.
(4) Delete calendar entry.
(5) Repeat calendar entry.
(6) Share calendar with others.
(7) Unshare calendar with others.
(8) Schedule a meeting with a number of users on calendaring system.
(9) Print calendar.

Project Management

Another aspect of desktop management is being able to schedule and plan projects. Many kinds of projects lend themselves to this type of software: relocation of an office, publication of a newsletter, publication of a training manual on how to use E-Mail, etc. Project management is a valuable tool in ordering the steps that must be taken in large projects. It can also be used to predict the impact of any delays and revisions and allows "what if" games with scheduling. For example, a manager could determine how much overtime will be necessary to finish a project on schedule if one stage is a week behind. OR A manager could do cost comparisons between doing jobs in-house or contracting with another company.

Most of this software has automated three traditional methods for managing projects:

(1) Gantt chart is a simple table used for scheduling project activities. A Gantt chart generally illustrates a time line of a project from start to finish.
(2) PERT chart, Project Evaluation and Review Technique, is based on estimating resources necessary to complete each task throughout a project. In the chart below, the boxes represent tasks. The arrows indicate that the first task must be completed before the second can start.

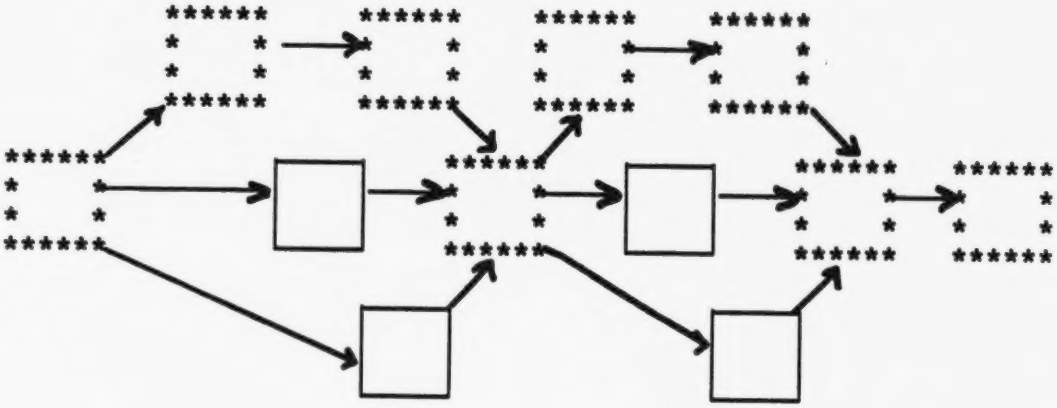

Figure 3. (PERT Chart)

(3) Critical Path Method (CPM) relies on estimating the time needed to complete each project task with the critical path representing the longest path through the network and the shortest possible time required for completion of the project. CPM and PERT are sometimes combined on one chart. In the PERT chart illustrated above, the boxes marked with asterisks (*) represent the critical path in this project. If critical path tasks take longer than estimated, the project will be late.

Other graphics which may be generated with project management software include bar charts, time lines, and flow charts. Which one of these graphics to use depends on the user's taste, the kind of organization, and the requirements of the project. Also, the cost and ability of the software package may be a factor. Regardless of the type of graphic used, it should illustrate the process of meeting goals by accomplishing a set of specific tasks.

To plan a project using project management software, each project must be divided into categories of tasks and resources. Using the example above of a PERT chart, discuss how to create a training manual to show how to use electronic mail. The different tasks would include creating the copy, typesetting, doing the layout, and printing. The resources are people (writers) and the tools (typesetters or desktop publishing). When the tasks and the resources are entered into the computer, the software creates the graphs or time lines that represent the work flow. The timesaving impact of this type of software is clearly seen when an organization is involved in large engineering or construction projects. The value of this software is in presenting possible conflicts and crises. However, it cannot make final decisions or solve problems--skills which are still the domain of people.

With project planning software, new charts can be regenerated when the project is off schedule or behind schedule.

Software packages which are available for this application include GANTTMaster, SKEDULE, Dartmouth Tracker, Schedule View, plus others.

If software is available, demonstrate it to the class. However, the capabilities of this kind of software can be accomplished by presenting a problem, such as the one illustrated below: (Note to instructor: A copy of the project planning problem is included in the "Student Materials" section as Exercise 2-3.)

****

PROJECT PLANNING PROBLEM

Problem: We need to determine the resources and tasks necessary to create a training manual for the database management program used in our classroom. Some of the necessary tasks are deciding what the content of the manual will be, typesetting, preparing the layout, printing the manual, testing the material, and rewriting if necessary. Some of the resources include writers and the typesetting capability. You may be able to think of other tasks and resources besides these that are listed.

Decide whether to use a flow chart, time line, or bar graph to illustrate the work on this project. The whole project should take about two months.

OR

Use the desktop publishing problem: Determine the resources and tasks necessary to create a departmental newsletter. Some of the necessary tasks are deciding what the content of the newsletter will be, typesetting, preparing the layout, and printing the newsletter. Some of the resources include gatherers of information, writers, the typesetting capability, and the printing source. You may be able to think of other tasks and resources besides these that are listed.

Decide whether to use a flow chart, time line, or bar graph to illustrate the work on this project. The whole project should take about two months.

To complete the requirements of either project:

1. List all the tasks and time lines for completion of the training manual. What additional tasks can you think of that are not already listed above?

2. List all of the resources needed to complete the project. What additional resources can you think of that are not already listed above?

3. Decide what kind of chart to use to depict tasks, time lines, and resources: bar chart, time line, flow chart, GANTT chart, PERT chart, or CPM.

4. Prepare a transmittal memo to your instructor to include with the chart showing the time line for the project.

5. If the typesetting or desktop publishing software is not available in the classroom by the time it is needed, please determine the one best way to proceed, given these two alternatives:

    a. Use an outside printer and pay $550 for the entire project, or
    b. Use the typesetter on campus who will charge us $10.00 an hour at eight hours a day for six days.

    Do a what-if comparison between the two alternatives. Make your recommendation in writing and include the justification. Prepare a second memo to your instructor which would include your recommendation with justification.

Project teams could be used to complete this exercise.

****

Telemanagement Software

Telemanagement software allows computer users to develop an electronic phone directory with hundreds of names. The names might be entered as follows:

Sandy Smith, 555-555-2321, Info Processing Dept.

If a modem is available, the cursor can be placed on Sandy's name and the computer will automatically dial 555-555-2321. Other software packages allow users to use certain databases, place the cursor on a line with a phone number, and call the number automatically. This kind of software eliminates searches through manual telephone lists, such as a Rolodex^{TM}, wrong numbers, and manual dialing.

In addition to dialing the call, the software also will keep track of time and charges for the call and for those kinds of jobs which require heavy telephone use and which bill clients on an hourly basis. In addition, some software will allows access to long distance systems such as MCI or Sprint. Like calendaring, it is important that this kind of application be in the background: it is accessible with one keystroke and does not require rebooting disks.

One additional aspect of telemanagement software is a notepad system. A notepad system is very much like a word processing package in that it uses the keyboard to enter information. The delete and insert features are available. Additionally, date and time may be added to the notepad and stored for future reference. For example, an insurance agent could use the automatic dialing feature of the software to call a client. The notepad could be used to take notes on types of insurance in which the client is interested and to store the information for future reference. If a tickler system is available on this same software, the insurance agent could add a future date to the tickler system to be reminded to call the client.

****

For this part of the course, ask students to find at least five software packages which pertain to telemanagement. Enter the names, addresses, and phone numbers into an electronic index (if available in the classroom). On the notepad, list a few of the features of each one of the five packages which make one program different from another. If software is not available, ask students to turn in five note cards, one for each of the software packages, with the requested information on each one.

(Note to instructor: This problem is included in the "Student Materials" section as Exercise 2-4.)

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PART 3

Formal oral reports by students will enhance the students' familiarity with software that is available for the automated office. Students should evaluate and present oral reports on the three selected software packages in Part 2 or they may be required to visit a vendor and ask for the opportunity to observe demonstrations of new software packages. It is critical that students demonstrate evidence of lab skills. That is, students should demonstrate that enough knowledge and effort has gone into the acquisition of skills to be able to manipulate the software.

Oral presentations should cover the following:

> **(Note: A form, SOFTWARE EVALUATION, has been developed with this information to be handed out to students. See "Student Materials" section. Classroom discussion regarding this evaluation form should precede the actual reviews so students and instructor will define the terms the same way; i.e., does "ease with which it accomplishes the functions" mean fewer keystrokes to perform a function or does it mean user friendly or does it mean that prompts are easily understood?)**

SOFTWARE EVALUATION

Name of software

Type of software (if not readily recognizable in the name of the software)

Version number and date

Developer (vendor, manufacturer)/name of company

Cost: list vs actual? what is included? license agreement? can back-up copies be made? vendor availability for problems [toll-free number]? are updates available at low cost? networked versions available? etc.

Requirements to run software: compatibility with hardware (specifically, type of PC, model #, etc.)? RAM required to support software? other peripherals required or supported? cabling required and available?

Printers supported or configuration requirements

Description of the scope of the functions of the software: what it is purported to do? ease with which it accomplishes the functions?

Terminology encountered: familiar or too many new terms? who could use it in the automated office and for what purposes?

Report on at least one review of the software in a current computing magazine or research service write-up to get the users' viewpoint. (These services include DataPro or Seybold reports.)

Value of the software to the automated office: will it save time? enhance decision making? etc.

Documentation: easy to read? learning disk or tutorial included? on-line help?

Limitations encountered with the software: what do you see as the drawbacks (keeping in mind that the perfect piece of software is never available)?

Recommendations: is it worth the cost? is it going to automate repetitive tasks or enhance decision making? what will be accomplished through the purchase of this software by a company? would documentation need to be rewritten? training required? other?

(Note to instructor: Require students to prepare a written handout for the other members of the class for future reference. Presentations will be enhanced through the use of slides, transparencies, handouts which provide copies of screens or output products, and other materials.)

SUMMARY: The purpose of Task Area 2 is the introduction to and hands-on familiarity with a wide variety of applications software packages which will provide students with a broad view of software capabilities for the automated office. In addition, introduction of new terminology and concepts should provide the foundation for the remainder of this course. The opportunity to develop evaluative skills and enhance communication skills is vital to the completion of this course.

GLOSSARY OF SOFTWARE TERMINOLOGY

add-ons: a software package which may be added to a more powerful or popular package which provides additional or improved functions.

ASCII: A U. S. standard code in which 7 binary bits can be combined to represent the characters on a typewriter keyboard. Most commercial VDT’s and printers utilize the ASCII code. Stands for American Standard Code for Information Interchange.

automatic index: the automatic production of an index for documents in a database.

calculations: the result of mathematical functions performed by the calculator capabilities of a computer or applications software package.

CGA Color Graphics Adapter: any type of computer graphics in which the images displayed on a CRT or VDT are shown in more than one color.

columns: in a spreadsheet software application program, the vertical data items in one set of lines of an array or table as contrasted with a horizontal row.

compatible: refers generally to the ability of two devices to work in conjunction with each other. If two software programs or two pieces of equipment can communicate without alteration to the document, then they are said to be compatible.

database management: software designed to control the creating, loading, and running of a database.

desktop publishing: microcomputer-based equipment, laser printer, and software combined to produce finished documents with integrated text and graphics and page make-up accomplished on screen. Equipment falls into one of two categories: purpose-built equipment and page-layout packages which run on microcomputers. Desktop publishing programs also are called page composition programs. The resulting page layout is called a mechanical, which is used to print as many copies as needed.

EBCDIC, Extended Binary Coded Decimal Interchange Code, is an 8-bit code used in data storage. Developed by IBM.

EGA Enhanced Graphics Adapter: an expansion card for the IBM-PC which provides high resolution graphics.

expert systems software can use human-like reasoning skills to solve problems.

firmware program chips is another development to watch. Some manufacturers have begun to develop their software on ROM chips instead of on disks.

fonts: a group of characters of a specific style or size. The term "font" is used to identify the group of characters available on a particular printer. Synonymous with type font.

footnoting: the capability of a software package which places information at the bottom of a page, usually for reference purposes.

import/export: the ability of a software package to receive or send documents to or from another software package.

integration of graphics: software that combines graphics with other distinct functions, such as electronic spreadsheets, word processing, database features, and communications.

interface is the point of contact between two systems or two parts of a system.

LAN Local Area Network: a system which links together computers, electronic mail, word processors, printers, file services, distributed logic, and other electronic office equipment to form an interoffice or intersite network. Such networks usually give access to external networks, called wide area networks or global networks. Transmission media may include telephone lines, coaxial cable, fiber optics, microwave systems, or satellites.

menus: a list of options or facilities from which a computer user can choose.

natural language software commands come close to duplicating communication language between human beings.

notepad: in calendaring or other desktop management software, a electronic notepad may be provided on which notes can be made and accessed at a later date, much like a manual tickler file.

outlining: the capability of a software package which integrates text editing and text management or manipulation. Also known as an "idea processor". Material is organized in indented outline form for topics and subtopics.

plug-in card: a card which may be plugged into the motherboard of a computer which will provide added capabilities, such as expanded memory, graphics, communications, clock, etc.

printer interface: a mechanism which provides communication between two printers.

proprietary software: copyright software sold on a commercial basis.

public domain: noncopyrighted software which is available free of charge or at a nominal fee from the developer.

report: any output document that lists, summarizes, or otherwise provides a user with the results of a processing operation.

rows: in a spreadsheet software application program, a horizontal representation of data items or other information contained in an array or a table as contrasted with a vertical column.

software: non-physical instructions and data contained in and carried by the computer's electrical circuitry. There are several kinds:

> **applications software programs**: sets of instructions that tell the computer system to perform specific tasks (i.e., word processing, database management, print labels, etc.). Each application is written to accomplish something in particular. The applications program uses the operating system to find its way around the hardware. Applications software packages can be better identified as:
>
> **general purpose software**, which includes packages, such as word processing, spreadsheet, database management, graphics, and communications.
>
> **special-purpose software**, which includes packages, such as accounting, records management, inventory, real estate management, insurance records management, etc.
>
> **enhancement applications software**, which has been created to improve the performance, convenience, and versatility of some of the more popular applications software packages. This software includes add-ons to popular software packages, such as Lotus 1-2-3 or AppleWorks and others; calendaring, utilities, grammar and spelling checkers, dictionaries and thesauruses, etc.

operating system software is a set of instructions that keep track of where all data and programs are located. It communicates with the computer's central processor and usually operates between the computer and the application software.

storage: the component of a computer system that holds data and programs. It includes storage built into the architecture of a computer which is terms internal or main storage and all of the devices and storage media that are capable of retaining and accessing data.

thesaurus: contains terms that are similar in meaning to other terms. A computer-based thesaurus provides support in two ways: (1) It provides an access method to an informational database in which the keys to the information are associated with English words that suggest their contents. There may be several terms, each with a similar meaning, that can be used for this access. (2) It can be used as an aid to writers and originators of text who utilize word processing and who want alternative terms for a particular word.

topology: the arrangement, physical or logical, of the nodes in a computer network. There are three kinds of network topology: bus, ring, token.

user interface: the point of contact between the user and the computer.

wide-area network, also called a value-added network (VAN): defined as any transmission or reception of signals, of writing, and of sounds by wire, radio, visual, or electromagnetic systems.

windows: the display on a VDT or CRT in which the viewing area is broken into separate windows each showing something different. The desktop manager approach uses windows, as do electronic spreadsheets.

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Brouillet, Frank B.; Janet L. Carlson, Jay Wood, Jack Ray, Mari C. Shaw, and Mary Scheyer. (February 1986) Microcomputer Curriculum Guidelines. Published by the Division of Vocational-Technical and Adult Education Services, Office of the Superintendent of Public Instruction, Old Capitol Building, Olympia, WA 98504.

Doepner, Barbara; Joan Flood; Ralene Kroenke; Peggy Loumos-Kennedy; Marson Rinkenberger; J. Joseph Daly; and Jack Sullivan. (1984) Electronic Information Systems: Post Secondary Business and Office Curriculum. Published by the Minnesota Curriculum Services Center, 3554 White Bear Avenue, White Bear Lake, MN 55110.

Groneman, Nancy and Susan Owen. (1988) Applications for the Personal Computer. Dallas: South-Western Publishing Company. (Excellent source of exercises.)

Saffer, Sally M. (1986) Insight into Office Automation. Dallas: South-Western Publishing Company.

Shelly, Gary B. and Thomas J. Cashman. (1984) Computer Fundamentals for an Information Age. Brea, CA: Anaheim Publishing Company, Inc., 2632 Saturn Street, P. O. Box 9600.

Selected Software Catalogs

800-Software Newsline: 918 Parker Street, Berkeley, CA 94710.

Campus Technology Products Company, P. O. Box 2909, Leesburg, VA 22075.

Chambers International Corporation, Education Industry Marketing Group, 5499 North Federal Highway, Suite A, Boca Raton, FL 33487.

The Public Domain Exchange (Apple II, Macintosh, IBM), 2074C Walsh Avenue, Department 601, Santa Clara, CA 95050.

Microcomputer Software, Career Aids, 20417 Nordhoff Street, Department C V 3 4, Chatsworth, CA 91311.

Suggested References for Exercises

Arntson, L. Joyce and Lora Brunello Todesco. (1987) Word/Information Processing: Exercises, Applications, and Procedures. Boston, MA: Kent Publishing Company.

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WordPerfect Lessons by WordPerfect Corporation. Available from Chambers International Corporation, 5499 North Federal Highway, Suite A, Boca Raton, FL 33487. Stock #01548. $20.00.

WordPerfect Training by Damon International, #02844, $33.00. Available from Chambers International Corporation, 5499 North Federal Highway, Suite A, Boca Raton, FL 33487.

WordPerfect Learning Disk and exercises which come with WordPerfect software package.

Enable Training by Damon International: 3 separate training software packages: Word Processing and Windows #02848, $26.00; Spreadsheet, Graphics, and Communications #02849, $26.00; Database Management #02850, $26.00; or three-disk set #02815, $39.00. Available from Chambers International Corporation, 5499 North Federal Highway, Suite A, Boca Raton, FL 33487.

Lotus 1-2-3 Training by Damon International, #02810, $33.00. Available from Chambers International Corporation, 5499 North Federal Highway, Suite A, Boca Raton, FL 33487.

MultiMate/MultiMate Advantage Training by Damon International, #02813/#02823, $33.00/$26.00. Available from Chambers International Corporation, 5499 North Federal Highway, Suite A, Boca Raton, FL 33487.

SuperCalc3 Training by Damon International, #02811, $33.00; and SuperCalc4 Training by Damon International, #02843, $33.00. Available from Chambers International Corporation, 5499 North Federal Highway, Suite A, Boca Raton, FL 33487.

DeskMate Training by Damon International, Tandy 1200/3000, #02846, $20.00. Available from Chambers International Corporation, 5499 North Federal Highway, Suite A, Boca Raton, FL 33487.

EnerChart Training by Damon International, #02816, $33.00. Available from Chambers International Corporation, 5499 North Federal Highway, Suite A, Boca Raton, FL 33487.

EnerGraphics Training by Damon International, #02817, $46.00. Available from Chambers International Corporation, 5499 North Federal Highway, Suite A, Boca Raton, FL 33487.

dBase III Plus Training by Damon International Corporation. Available for two levels: entry level and programming level. Entry level, #02824, $39.95; programming level, #02809, $46.00. Available from Chambers International Corporation, 5499 North Federal Highway, Suite A, Boca Raton, FL 33487.

dBase III Training by Damon International, #02835, $46.00. Available from Chambers International Corporation, 5499 North Federal Highway, Suite A, Boca Raton, FL 33487.

dBase II Training by Damon International, #02819, $39.00. Available from Chambers International Corporation, 5499 North Federal Highway, Suite A, Boca Raton, FL 33487.

Building Your First Expert System by Ashton-Tate Publishing. #01803,, $25.00. Available from Chambers International Corporation, 5499 North Federal Highway, Suite A, Boca Raton, FL 33487.

IMSATT-2000 Advanced Authoring Software. #IMS21, $1,495. Available from Campus Technology Products Company, P. O. Box 2909, Leesburg, VA 22075.

Enable/Learn by The Software Group. #02313, $400.00. Available from Chambers International Corporation, 5499 North Federal Highway, Suite A, Boca Raton, FL 33487. This is comprehensive courseware for teaching Enable. The Learn package consists of 15 lessons, including exercises and review questions, and is designed to be taught in 20-24 hours of classroom instruction. The package includes one educational, limited version Enable software, an instructor's manual with a comprehensive teaching syllabus, 10 student workbooks, and 7 sets of transparencies. Limitations involve file size and the absence of the "Perspective" 3-D graphics package. ALSO Enable Learn from The Software Group, #ENC2, $425.00. Available from Campus Technology Products Company, P. O. Box 2909, Leesburg, VA 22075. (This package contains limited version Enable, 11 student workbooks, 1 teacher's manual, and one complete set of documentation with the limited software.)

Electronic Mail. Cat No. 13515P, $80.00. MPC Educational Publishers, 3839 White Plains Road, Bronx, NY 10467-5394.

Telecommunications Technology and Devices. Cat. No. 13518P,$90.00. MPC Educational Publishers, 3839 White Plains Road, Bronx, NY 10467-5394.

Four Software Tools with WordPerfect, VP-Planner, and dBase III Plus by Tim Duffy. (1988) Available from Wadsworth Publishing Company, Ten Davis Drive, Belmont, CA 94002.

Four Software Tools (alternate edition) by Tim Duffy. (1987) Four applications cover DOS, WordStar, DBase III, and VP-Planner. Available from Wadsworth Publishing Company, Ten Davis Drive, Belmont, CA 94002.

A Casebook: Four Software Tools by Tim Duffy. (1987) 28 cases real business situations for WordStar, Lotus 1-2-3, dBase. Available from Wadsworth Publishing Company, Ten Davis Drive, Belmont, CA 94002.

Software training manuals are available from South-Western Publishing Company for WordPerfect, Displaywrite 4, Displaywrite 3, Appleworks, and MultiMate Advantage. Check latest catalog for prices and latest additions.

Smith, Gaylord. (1986) 1-2-3 Quick. Dallas: South-Western Publishing Company. (Lotus 1-2-3 Tutorial)

Drum, William O. (1986) Database Applications. Dallas: South-Western Publishing Company.

Reiss, Levi and Edwin Dolan. (1989) Using Computers: Managing Change. Dallas: South-Western Publishing Company. (Will include tutorials for VP-Planner, dBase III+, and WordPerfect.)

McGraw-Hill Integrated Software Series consists of four program modules that can be used independently or integrated into a unique teaching/learning tool. The modules are McGraw-Hill Word Processing, McGraw-Hill Spreadsheet, McGraw-Hill Database, and McGraw-Hill Graphing. Check Gregg's catalog for latest prices and additions.

Also from Gregg:
101 Word Processing Exercises
101 Database Exercises
101 Spreadsheet Exercises
Integrated Software Applications
Word Processing Applications: Basic to Advanced

COMPUTER BUSINESS APPLICATIONS II

Task Area 3

Given a list of computer hardware, software, peripherals, storage devices, and other equipment, the student will be able to develop factors to be considered in comparison and evaluation of strengths and weaknesses and in selection, modification, and utilization of automated equipment and software for the information systems to the satisfaction of the instructor.

Suggested teaching strategies: Class discussion, outside readings, and small-group work. **Students should read two articles which deal with comparing and evaluating computer hardware and software to share during the class discussion.**

Class discussion:

One of the hardest tasks for management in the automated office after making the decision to automate is the selection of hardware and software which will provide the features required. Making a decision from a constant array of existing and developing technology is mind-boggling. Prepare a list of computer hardware, software, peripherals, storage devices, and other equipment which are available for the automated office, such as:

> Hardware: monitors, floppy and hard disk drives, central processing units (CPU), minicomputers, mainframes, keyboards, file servers, dot matrix printers, laser printers, near-letter quality printers, ink jet printers, facsimiles, networks (LANs, global), chips, plotters, electronic typewriters...and others.
>
> Software: general purpose applications software: word processing, spreadsheet, database management, graphics, integrated, telecommunications; special-purpose applications software: accounting, desktop publishing, desktop management (calendaring, project management, notepad, ticklers, telemanagement), legal, medical, records management, insurance-specific, airline reservations, real estate management, inventory, games, puzzles, educational, keyboarding, value-added (Dow Jones News/Retrieval, The Source, Compu-Serve, etc.), forms management...and others; and systems software: DOS, CP/M, MS-DOS, PC-DOS, Unix, Xenix, ProDos...and others.
>
> Peripherals: mouse, graphics tablets, modems, black boxes, plug-in cards, joysticks, cables, laser fonts,

intelligent copiers, light pens, buffers, touch screens...and others.

Storage devices: floppy disks, hard disks, RAM disks, cassettes, magnetic tapes, CD-ROM, optical disks, bubble memory, holography...and others.

Other equipment: ergonomic chairs and desks; storage equipment for disks, cassettes, and tapes; add-on 10-key pads; paper feeders; paper; ...and others.

Already, we begin to see the dilemma facing the person in the organization who is in the market for automated equipment or who is planning to upgrade existing equipment. For each one of the items listed above, there are at least ten or more choices which could be made. New items are available almost on a daily basis. If this is not enough, updating and upgrading are occurring constantly in order for hardware and software vendors and manufacturers and dealers to remain competitive.

As prospective end users, it may become your job to assess, evaluate, and make recommendations for purchasing hardware and/or software or other computer equipment for your particular organization. You have just completed an assignment to learn three new software programs or new applications for familiar software. In order to complete this assignment, you probably asked questions of someone who was familiar with the software (a vendor or end user) or you used your own experience with other software and hardware to develop your evaluation and recommendations at the conclusion of your oral reports. What were some of the questions that you asked when you were learning the software?

In addition, you have been asked to read two articles having to do with how to compare and evaluate computer hardware and software and to bring these articles with you to class. Add what you learned from reading these articles to develop a list of factors in selecting computer hardware or software. (Note to instructor: Develop the list as the students come up with the factors. Add your own factors to begin the discussion or to keep it going.)

Important Factors in the Selection of Computer Software and Hardware

Who is the manufacturer?

When was it put on the market? Latest version?

What does it cost retail vs actual cost?

Questions pertaining to software:

How easy is it to use? Define "easy to use". Does it mean it uses fewer keystrokes to perform functions? Does it mean that the prompts are understandable? Does it mean that the person already knows it so well that it's easy to use? Does it mean that it performs functions in a logical manner? Decide as a group what this means so that everyone is comparing apples to apples.

What is the purpose of the software? Who could benefit by using this software?

Can I understand the documentation? Is there a learning disk or a tutorial for the software?

Is there on-line help? Is there a 800 number?

How many disks does it take to load the program?

Does it have a dictionary/thesaurus or speller? How many words in the dictionary, thesaurus or speller? Can words be added to each?

How long will it take me to produce a document?

What hardware does it run on? What other configurations are required?

How much RAM does it take? How easy is it to expand or add memory?

...Others as group mentions them. (Save this list so that other factors can be added.)

Questions pertaining to hardware:

How easy is it to use? Define "easy to use".

What is the purpose of the hardware? Who could benefit by using it?

Can I understand the documentation?

Is there on-line help? Is there a 800 number?

What software does it run? What other configurations are required?

How much RAM does it have? How easy is it to expand or add memory?

...Others as group mentions them. (Save this list so that other factors can be added.)

Small-group work:

In most organizations, it will be appropriate to form project teams or committees to make recommendations for the selection and acquisition of hardware, software, peripherals, or other automated equipment. Students will be assigned to a work groups in order to come up with a more complete list of factors that should be considered when making recommendations for selecting and acquiring software and hardware for the automated office. The list which each group generates should be developed into a form which will be shared with the rest of the class. After each group has met, the class will come back together and share the format and factors generated through the group discussion. New factors will be added to the list which was started above.

Each group will have a recorder who will develop the list of factors and put items in some kind of format on a transparency. Using the transparency, one person from each group will make the oral report on the group's work. From these lists, the class will compile a class needs/ activities form which will be used to complete the assignment to compare and evaluate hardware and software.

This whole assignment may take two days to complete; however, allow at least one class period for this exercise. The resulting factors must be as complete as possible in order to provide students with the questions which will make them as knowledgeable as possible about the software/ hardware which they will evaluate.

Note: Instructors may want to make computing magazines and other materials available to students during the small group discussion for reference purposes.

****

Results from the small group exercise should produce an assessment form which has been developed for that particular class; therefore, the content and form will vary for each class. However, it is vital that these factors be included on the list:

Compatibility of software/hardware/peripherals: operating system, memory (RAM), printers, display, graphics, disk drives, keyboards, back-up support, etc.

Cost parameters (list vs actual)

Is the documentation understandable? Tutorial available? Learning disk? By whom? Beginner? Experienced user?

Availability and cost of maintenance/service contracts

Vendor reliability and reputation: support? Can you readily talk with someone knowledgeable about the software? Is there a user group or a vendor newsletter? What do the reviews in magazines say about the vendor?

Dealer training? At additional cost or included in the cost of the hardware/software? Will the dealer demonstrate on site? Will the dealer lend the equipment for trial usage?

Dealer reputation: Does the dealer stand behind the equipment through timely, professional service?

Generic features:

What essentials must the software/hardware have as a bare minimum?

What features would be nice to have?

What other features could be added without additional cost?

How easy is it to use? (Develop a common definition for the class for "ease of use".)

Is it user-friendly?

What is the manufacturer's policy regarding program updates?

Features for software might include:

The buyer must decide: integrated applications, menus which are unobtrusive, command consistency in an integrated package, data compatibility, concurrency, windowing, commands using few keystrokes, macros, columns, graphics, help screens, justification, pagination, headers/footers, page breaks, import/export capabilities, ease of formatting reports, ease of creating graphics, etc. before shopping.

THE CRITICAL FACTOR IS TO FIRST KNOW WHAT YOU WANT SOFTWARE TO DO. WHAT ARE THE NEEDS?

Is the software forgiving; i.e., are there safeguards against erasing data on disks or recovering from accidentally erasing information?

Is speed a factor? How fast does the software load? use its dictionary/thesaurus? How fast does the cursor move through the document on the screen?

Does it do what it is advertised to do? Don't take for granted that what you saw in the dealer's/vendor's showroom will be what you get. Ask to enter your own data and process the data using the software to be purchased, preferably on the same kind of equipment that will be available to the user. If the software does not produce the desired results, or if the store or vendor will not allow the user to use the software, then the software package should not be purchased.

Can back-up copies be made? Is a license or site agreement available and affordable? If not, are the extra copies affordable?

Can the software be copied on to a hard disk?

What are the quirks of the software? (Doesn't run in months with R's or at all during years evenly divisible by 4? Not funny when it takes time to go around them.)

Features for hardware might include:

The buyer must decide: color monitor, tilt screen, disk drives (floppy or hard or both), a certain kind of keyboard, printer [dot matrix, near letter quality, laser], plotters, cables, modems, cassette backup, RAM specifications, operating system specification, etc.) before shopping for hardware.

THE IMPORTANT FACTORS HERE ARE EXPANDABILITY, COMPATIBILITY, AND CONNECTIBILITY--FACTORS WHICH APPLY TO HARDWARE, SOFTWARE, PERIPHERALS, TELECOMMUNICATIONS, NETWORKING, ETC.

Does it do what it is advertised to do? Don't take for granted that what you saw in the dealer's/vendor's showroom will be what you get. Ask to enter your own data and process the data using the hardware to be purchased. If the hardware does not produce the desired results, or if the store or vendor will not allow the user to use your software on the hardware, then the hardware should not be purchased.

What kind of security is provided by the manufacturer? What kind of security is needed by the organization to protect hardware? What will it cost to install what the user wants?

What are the rights of the buyer?

How available are the supplies that will be needed? Are they affordable? Do they have to be ordered special? What kind of paper is required by the printer? What kind of printer cartridge is required? What kinds of workstation supplies will be needed besides disk labels, special marking pens, disk storage devices, covers for disk drives and keyboards? Does the printer need to be covered to block the noise? Does the monitor require a swivel stand or tilt stand? How many supplies should be on hand at any time?

What color display monitor will the software support? What color is wanted by the end users? Is the resolution (sharpness of the image) of the display easy to see? How many lines can be displayed? Is it 80 column? Is it capable of handling more than 80 columns of text or graphics?

What kind of back-up support is needed? Cassettes? Tape drives? What is the cost? Where and what kind of storage is needed for the back-up copies?

What kind of storage equipment is needed for disks, cassettes, tapes?

Can a network be supported on this equipment? What kinds of cables and interfaces are necessary? What topology is required? Is communications software part of the cost of the network?

...Other factors as mentioned. As changes occur, other factors will emerge.

(Note to instructor: This task area sets the stage for the remainder of this course. It is recommended that enough time be spent on this exercise so that you are satisfied that students have a grasp of the numerous complex factors in evaluating and comparing automated equipment for the automated office.)

COMPUTER BUSINESS APPLICATIONS II

Task Area 4

Given a list of factors developed for the comparison, evaluation, selection, modification, and utilization of automated equipment, **the student will be able to:**

(1) develop evaluative skills by comparing and evaluating hardware and software in the classroom lab or in vendor showrooms on a variety of automated equipment to the satisfaction of the instructor; and

(2) present oral and written critiques and evaluations of the specific automated equipment, both individually and in groups to the satisfaction of the instructor.

Suggested teaching strategies: Concurrent with the completion of exercises and demonstrations of applications software and with the development of the evaluation factors, lab time should be arranged so that students can complete the critiques. Critiques may be completed individually or in small groups. Completion of at least one critique in a project team situation is highly encouraged.

Evaluations and critiques should build upon knowledges and skills gained in the Computer Business Applications I course as well as the hands-on experiences in this course. The nature of this course requires laboratory time to develop the necessary skills. For this reason, it is recommended that four (4) hours' credit be assigned to this course. **The evaluation form developed by the class in Task Area 3 should be used as the basis for students' oral and written critiques.**

At the end of this task area, the student will be able to:

(1) Use the factors developed by the class to complete five evaluations of hardware or applications software packages for the automated office or a combination of hardware and software evaluations. One of the five critiques will be completed as a project team. **It is desirable for students to critique a combination of hardware and software rather than focus on one or the other. The knowledges gained during the critiques will be used for evaluation of the case study in Task Area 5.**

(2) Write critiques for each of the five evaluations. At least one of the written

critiques will be completed as a member of a project team.

(3) Present oral critiques for each of the five evaluations. At least one of the oral critiques will be presented as a member of a project team.

(4) Make recommendations for software, hardware, and other peripherals for use in the automated office based on the completed evaluations.

Suggested teaching strategies:

1. Individual project work, as well as project team work, may be assigned to complete the requirements for these task areas. This should be accomplished during lab time. Evaluation of students' work will be made on the basis of individual contributions as well as overall project team efforts.

2. Selection of hardware and software to be evaluated will depend on availability in the classroom or lab and on access to vendors within the geographical area. It is **strongly recommended that students be asked to make their selections based on equipment or software which is unfamiliar to them.** The case study included in Task Area 5 will give some idea of the breadth of knowledge which students should acquire during these evaluations and critiques.

   If accessibility to hardware and software is severely limited, assign the critiques as library research. An abundance of material is available in the many computing magazines on the market.

3. Specific hardware to be investigated may include but not be limited to the following:

   Mainframes
   VAX
   File servers (minicomputers)
   IBM (with PC-DOS, MS-DOS, or OS-2)
   IBM PC clones
   IBM PC compatibles, such as: Zenith, AT&T, and others
   Macintosh
   Apple IIGS
   Digital Equipment Corporation (DEC Rainbow or other)
   Laptop/portable microcomputers
   Wang PC's

   Other PCs: Tandy, Eagle, Leading Edge, Apple IIe, Toshiba, Compaq, etc.

Printers: dot matrix, lasers, ink jet, near letter quality, letter quality, ion deposition

Telecommunications: networks, modems, LANs, satellite and microwave communications, fiber optics, leased lines, multiplexors, black boxes, etc.

Peripherals: mouse, light pen, touch screens, FAX, TWX/Telex, value-added networks, disk drives, hard disks, CD-ROM, optical disks, Dayna File, OCR, etc.

Operating systems: PC-DOS, MS-DOS, PRO-DOS, CP/M, OS/2, Unix, Xenix, Oltrix, microcomputer chips, etc.

Dedicated equipment: CPT, Philips, Wang, NBI, etc.

3. Specific software to be investigated may include but not be limited to the following:

WordStar 2000, Release 3
dBase (latest)
MultiMate Advantage
Windows
Lotus Symphony
Overhead Express
Cross Talk/Easylink
AppleWorks
Smartware
MacWrite, MacDraw, MacPaint
Ventura Publishing
DiagramMaster
Signmaster
All-in-1 (DEC)
List Processing
Reportpack
BPI (accounting)
Peachtree/Ware
Smart Com
MacLink
Harvard Project Manager
PROFS
WordStar Pro
WordPerfect (4.2, 5.0)
Lotus 1-2-3
Multiplan
DisplayWrite 4
Framework
Harvard Pres Graphics
PFS Series
Microsoft Word
Enable
Aldous Pagemaker
Chartmaster
Diagraph
DEC Mail
Jazz
RBase
Syntrex
Visicalc
AppleTalk Network
MacTerminal
Excelerator
VP-Planner
Alis-Applix
DeskMate

...and many others (depending on availability in classroom or in geographical area)

4. Oral reports will be made to the class by individuals or project teams covering the important factors relating to the computer hardware and/or software. Handouts by individuals or project teams should be made

available to the class for future reference. Audiovisuals will enhance the effectiveness of the oral reports.

5. Well-thought-out critiques will be reflected in the quality of the recommendations which are made by the individuals or teams. A written critique will be handed to the instructor for evaluation purposes.

6. Suggested teacher evaluation forms are included in the "Evaluation" section for oral and written reports.

SUMMARY: The purpose of this task area is to provide students with as many opportunities as possible to develop evaluative and decision making skills which will enhance their knowledge of the technologies impacting on the automated office. The emphasis in this task area is placed on communications, decision making, and interpersonal skills.

COMPUTER BUSINESS APPLICATIONS II

Task Area 5

Given a specific case study related to the selection of computer equipment and software for an automated office, the student will be able to (1) demonstrate the ability to make recommendations regarding the acquisition of specific hardware and software using the knowledges obtained in the critique and evaluation of computer equipment; and (2) prepare oral and written reports containing the specific recommendations to the satisfaction of the instructor.

Suggested teaching strategies: Divide the class into as many project teams as is feasible and assign the case study. As few as three and as many as eight persons could be in each project team. **A copy of the case study is included in the "Student Materials" section as Exercise 5-1.**

Assign the final team project which will require a formal oral presentation to the class which covers the recommendation for an information system, including software, hardware, and other peripherals, for the automated office. The oral presentation should be made as a team. Handouts will be provided to the class. Visuals will enhance the quality of the presentation. Individual and project team evaluations should be made by the instructor.

The purpose of this exercise is to combine all of the elements which have been explored separately. A formal written presentation should be made to the instructor as the bank president.

CASE STUDY

You are the administrative assistant for the Vice President of Administrative Services for a large international bank with headquarters in New York City. The scope of the vice president's job includes the computer system for the bank. The responsibility for the computer system in this bank also involves implementing office automation tools.

Presently, the system has permitted each department to do its "own thing" in acquisition of hardware and software; therefore, most departments have word processing, spreadsheet, database management, graphics, and some desktop publishing capabilities. Fortunately, most of the departments are using IBM or IBM compatible equipment and software. Printer quality varies, depending on the department. The quality ranges from dot matrix in the bookkeeping department to HP LaserJet Series II in the top executives' offices. Desktop publishing is being done by the public relations department on a Macintosh, using Aldous Pagemaker and an Apple LaserWriter.

There is neither electronic communication nor networking being done between or within departments. Some departments have capabilities of accessing information in the bank's mainframes by way of dumb terminals--CRT's which can be accessed for "information only". Generally, this is done when customers call in for account balances, loan data, or other inquiry-type information. In other words, the end users cannot change the information that resides in the mainframe's databank.

Your supervisor has asked you to serve on a task force with four or five other administrative assistants and banking professionals in the headquarters to make suggestions for replacing existing hardware and software and other peripherals so that the entire headquarters unit is using the same or compatible equipment. If the system is successfully implemented in the headquarters, it will be adopted by the entire bank system. Your supervisor thinks this is also a good time to implement other capabilities. Specifically, the new system should enable the personnel in the headquarters to do the following:

(1) continue, if possible, to use the word processing, spreadsheet, database management, graphics, and other applications software files which have been created by each department

(2) share data files with other offices in the headquarters and the bank's offices in other states and other countries (eventually)

(3) establish access to, linkages with, and passwords for the records and data which are stored on one of the bank's mainframes for all persons associated with the headquarters (and, ultimately, all persons in other offices) who will need to access and manipulate the data

(4) communicate internally with other offices in the headquarters building

(5) communicate externally with branches in other states and countries (ultimately)

(6) establish electronic mail boxes to alleviate 'telephone tag' and to avoid higher mailing costs

(By the way, the bank does have a new Rolm telephone system which has voice mail on it.)

(7) establish central locations in the headquarters for printers/copiers in order to utilize this equipment more effectively and efficiently

(8) receive training on the system and documentation support when the proposed system is adopted: who will do the training, how will it be offered (classroom, on-the-job, videotape, etc.), how often will it be offered, and to whom, etc.

(9) provide for upgrading and updating the system

(10) pinpoint areas of future growth and expansion

****

The specific assignment given to the task force is to:

1. make a recommendation for hardware, software, and other peripherals which will be utilized at all levels of the organization, including bank officers, in the headquarters and (ultimately, branch locations). The factors outlined above should be taken into consideration and addressed in the report.

2. make a formal oral presentation which would include the use of visual aids and a formal written presentation to the bank president (instructor).

A formal presentation has been scheduled for the bank president's staff in one month so that a decision can be made and implemented.

****

Questions for class discussion prior to project work:

1. What are some of the weaknesses of the present computer system at this bank?

   No coordinated buying, no one source for software or hardware, no telecommunications, no networking, 'telephone tag', no thought as to what the bank should be doing in the area of office automation, lack of accessibility by all departments to the bank's large databank, lack of security of data, etc.

2. What are some of the strengths of the present computer system at this bank?

   IBM or IBM compatible equipment, Macintosh for desktop publishing (which will network with IBM's), support of office automation evidenced by equipment, new telephone system, looking ahead toward growth and expandability, etc.

3. What is the role of the task force?

   Advisory: make recommendations which are well thought out, well researched, and well presented.

4. What are some of the things that the task force could do to enhance its role?

   Ask for input from end users (all levels) through one-to-one interviews or surveys. Since there is not much time to prepare the presentation, probably one-on-one interviews will be the quickest and easiest.

   Visit and observe the equipment in action. Are there some good things being observed? What are some of the problem areas observed? (For example, long waits for printers or copiers; long walks to pick up printing; lack of information quickly available to complete a task when access to the information on the mainframe could save considerable time; lack of sharing of files which is resulting in duplicated information and tasks; etc.

   Visit vendors or invite vendors in for a vendor conference to discuss needs and ask for proposals.

   Read.

   Listen.

   Ask questions.

5. Discuss possible equipment solutions to this case study.

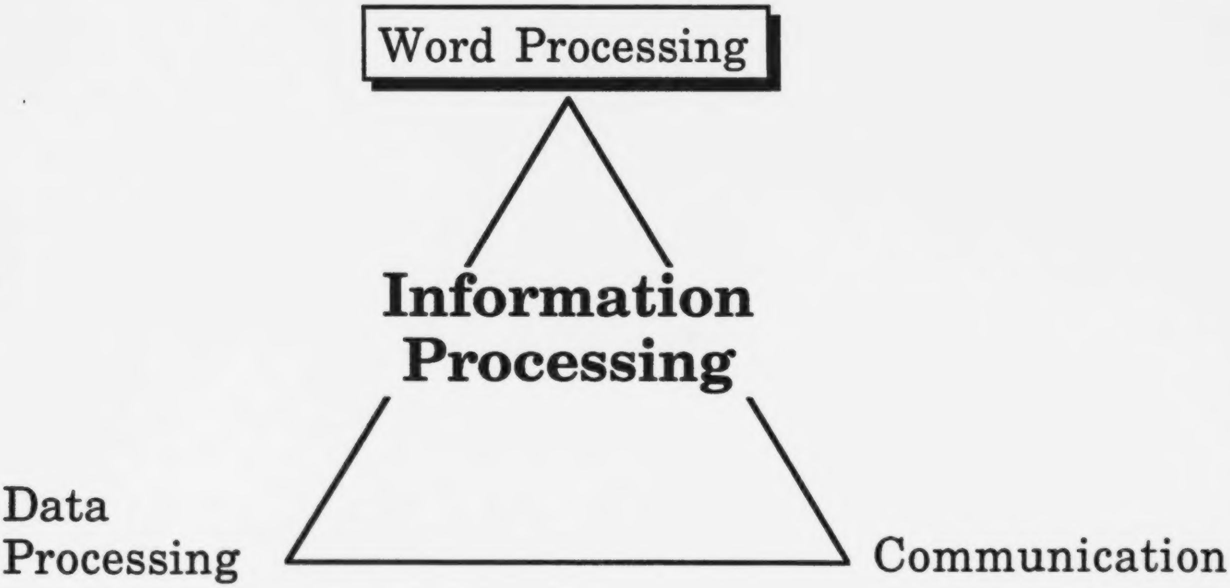
6. Discuss possible areas of expansion, updating, and upgrading which will need to be considered.

Computer Business Applications II

course two

Visuals

CBAII-1



Word Processing

Information Processing

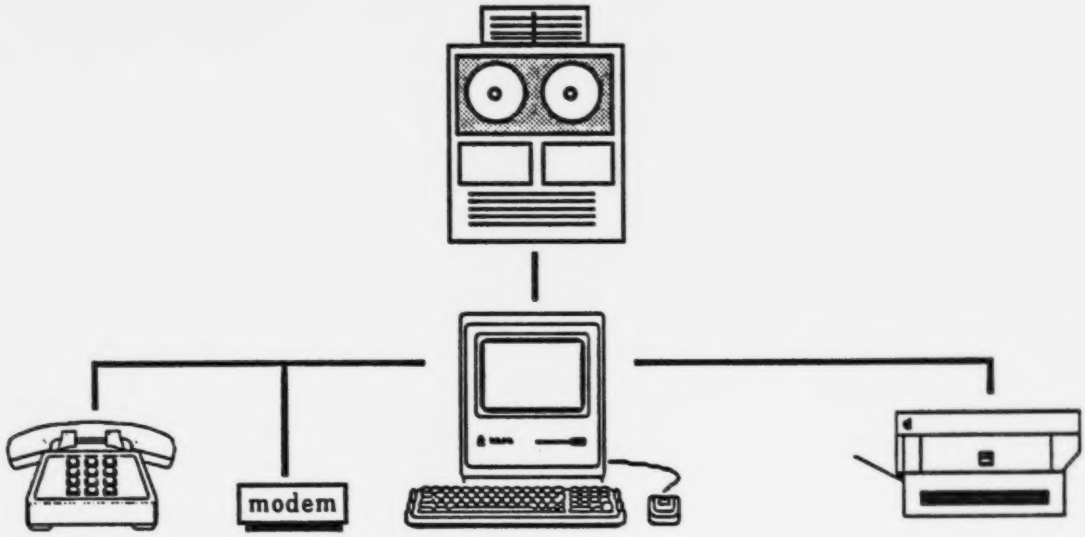
Data Processing

Communication

THE PROFESSIONAL WORKSTATION

MICROCOMPUTER
TELEPHONE
MODEM
PRINTER
STORAGE MEDIA
SOFTWARE

COMBINED WITH ERGONOMICS



THE PROFESSIONAL WORKSTATION
GROUPS TOGETHER
MANY INFORMATION SYSTEMS
COMPONENTS, SUCH AS

COMPUTERS
RECORDING MEDIA
PERIPHERALS
SCANNERS
IMAGE PROCESSORS
TELECOMMUNICATIONS
NETWORKS
NETWORK SERVERS
SOFTWARE

COMPUTERS ARE AN INTEGRAL PART OF THE PROFESSIONAL WORKSTATION

MICROCOMPUTERS

MINICOMPUTERS

MAINFRAMES

AND THE NEWEST ADDITION

PORTABLES

HANDHELD
LAPTOP OR NOTEBOOK-SIZED
TRANSPORTABLE

FEATURES OF MICROCOMPUTERS

DISPLAYS

VDT
CRT
LCD
EL
GAS PLASMA
FLAT-PANEL
NON-DISPLAY

FEATURES OF MICROCOMPUTERS

KEYBOARDS

ALPHANUMERIC KEYS
FUNCTION KEYS
"SOFT" KEYS
"HARD" KEYS
DUAL-FUNCTION KEYS
COMMAND KEYS
TEMPLATES
QUICK REFERENCE CARDS

OTHER INPUT DEVICES

LIGHT PEN
MOUSE
OCR
COMMUNICATING WORD PROCESSOR
VOICE
DISK

FEATURES OF MICROCOMPUTERS

CENTRAL PROCESSING UNIT

ROM CHIPS

RAM CHIPS

PROM CHIPS

EPROM CHIPS

CMOS

RECORDING MEDIA (STORAGE/RETRIEVAL)

PAPER TAPE

MAGNETIC TAPE

MAGNETIC CARDS

FLOPPY DISKS

HARD DISKS

BUBBLE MEMORY

HOLOGRAPHY

OPTICAL DISK

CD-ROM

PERIPHERALS

PRINTERS

LETTER QUALITY
LASER
DAISY WHEEL
THIMBLE
TYPEWRITERS

NEAR-LETTER QUALITY

DOT MATRIX

INK JET

INTELLIGENT
(SOMETIMES REFERRED TO AS
COPIER/PRINTERS

PERIPHERALS

PLOTTERS

PRODUCE 3-D IMAGES,
CURVED OR STRAIGHT LINES,
COLOR GRAPHICS IN
READY-TO-USE FORMAT

FOR
TRANSPARENCIES
SLIDES

MOST PLOTTERS IN BUSINESS APPLICATIONS ARE CALLED PEN PLOTTERS.

PERIPHERALS

FACTORS TO CONSIDER IN SELECTING PLOTTERS:

KIND OF INFORMATION
VARIETY OF APPLICATIONS
NEED FOR SPEED
QUALITY OF PRINT
LOCATION OF EQUIPMENT
NUMBER OF USERS
AMOUNT OF BUDGET

SCANNERS

ALSO CALLED
OPTICAL
CHARACTER
READER (OCR)

"READS" OR SCANS
TYPEWRITTEN PAGE AND
PLACES CONTENTS OF PAGE
ON MAGNETIC MEDIA OR
INTO RAM MEMORY
TO BE READ ON A VDT
AND MANIPULATED INTO
FINAL FORMAT BY
SUPPORT PROFESSIONAL

IMAGE PROCESSORS
(REPROGRAPHICS PROCESSES)

PHOTOCOPIERS

PHOTOTYPESETTERS

INTELLIGENT
COPIER/PRINTERS

IMAGE PROCESSORS
(REPROGRAPHICS PROCESSES)

FACTORS TO CONSIDER IN SELECTING A REPROGRAPHICS PROCESS:

APPEARANCE OF COPIES

NUMBER OF COPIES

SIZE OF PAPER

SPEED OF PROCESS

COSTS OF EQUIPMENT

AMOUNT OF BUDGET

KINDS OF CONTROLS
TO BE IMPOSED TO
AVOID ABUSES

TELECOMMUNICATIONS
IS USING AUTOMATED TOOLS
TO COMMUNICATE OVER
DISTANCES

TELECOMMUNICATIONS TERMINOLOGY:

PROTOCOLS

CONNECTIVITY
COMPATIBILITY
EDITABILITY
PROCESSABILITY

MODEM

BLACK BOX

NETWORK

EBCDIC
ASCII

COMPUTER-BASED MESSAGE SYSTEMS

COMPUTER-BASED VOICE MESSAGE SYSTEMS

FACSIMILE

COMMUNICATING WORD PROCESSORS

TELECONFERENCING

NETWORKS ARE COMPOSED OF COMPUTERS, WORKSTATIONS, COMMUNICATIONS HARDWARE AND SOFTWARE, AND RELATED CONNECTIONS THAT ENABLE INFORMATION TO BE ACCESSED, SHARED, AND TRANSFERRED.

NETWORKS

PUBLIC DATABASES

LOCAL AREA NETWORKS
(LANS)

WIDE AREA NETWORKS
(ALSO CALLED VALUE-ADDED
NETWORKS)

NETWORKS

PUBLIC DATABASES
ARE USUALLY DESIGNED
BY SERVICE ORGANIZATIONS
AND MAY BE USED IN LIEU OF
INDEPENDENTLY DESIGNED
DATABASES--USUALLY
FOR A FEE.

THEY OFFER MARKETING,
ENTERTAINMENT,
COMMUNICATIONS, AND
OTHER SERVICES.

NETWORKS

WIDE AREA NETWORKS ARE DEFINED AS ANY TRANSMISSION OR RECEPTION OF SIGNALS, OF WRITING, AND OF SOUNDS BY WIRE, RADIO, VISUAL, OR ELECTROMAGNETIC SYSTEMS.

VALUE-ADDED NETWORKS ARE DESIGNED TO INTERFACE VOICE, VIDEO, FAX, DATA, AND TELECONFERENCING CAPABILITIES.

NETWORKS

LOCAL AREA NETWORKS (LANS) GENERALLY COVER A LIMITED GEOGRAPHIC AREA, ARE PRIVATELY OWNED AND DESIGNED, AND USER ADMINISTERED.

APPLICATIONS OF LANS INCLUDE:

HARDWARE RESOURCE SHARING

INFORMATION RESOURCE SHARING

E-MAIL

NETWORKS

LANS ARE
TIED TOGETHER IN
SOME KIND OF
CONFIGURATION OR PATTERN,
CALLED A TOPOLOGY.

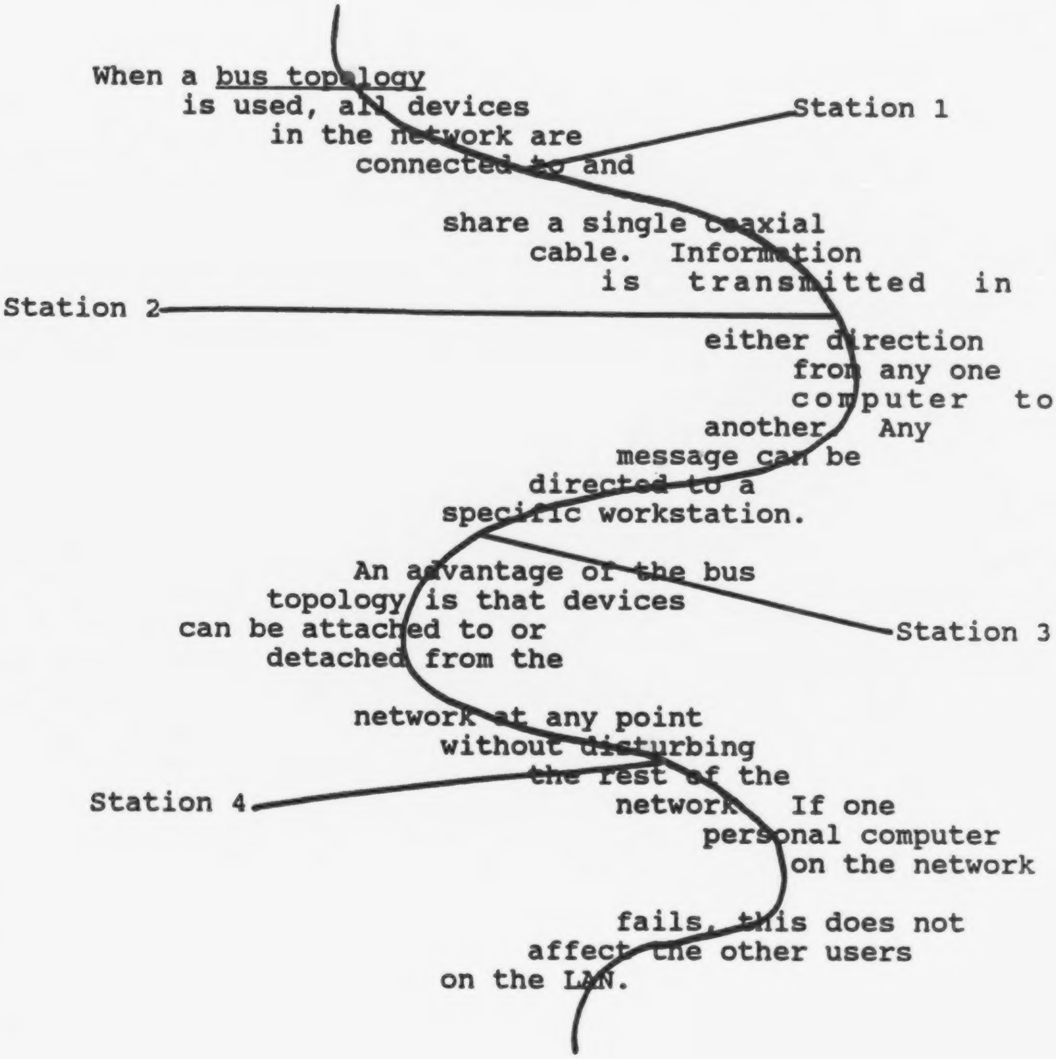
THREE MOST WIDELY USED
TOPOLOGIES:

BUS

RING

STAR

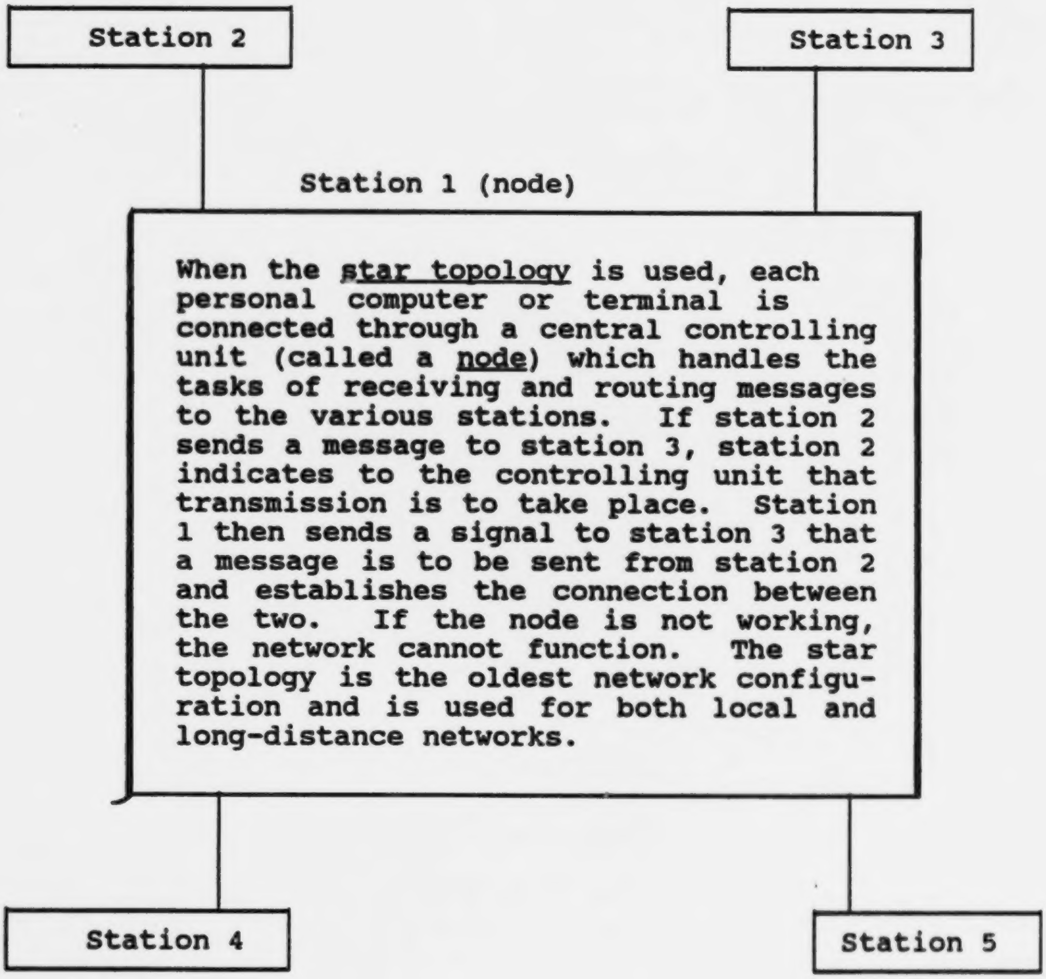
BUS TOPOLOGY



When a bus topology is used, all devices in the network are connected to and share a single coaxial cable. Information is transmitted in either direction from any one computer to another. Any message can be directed to a specific workstation.

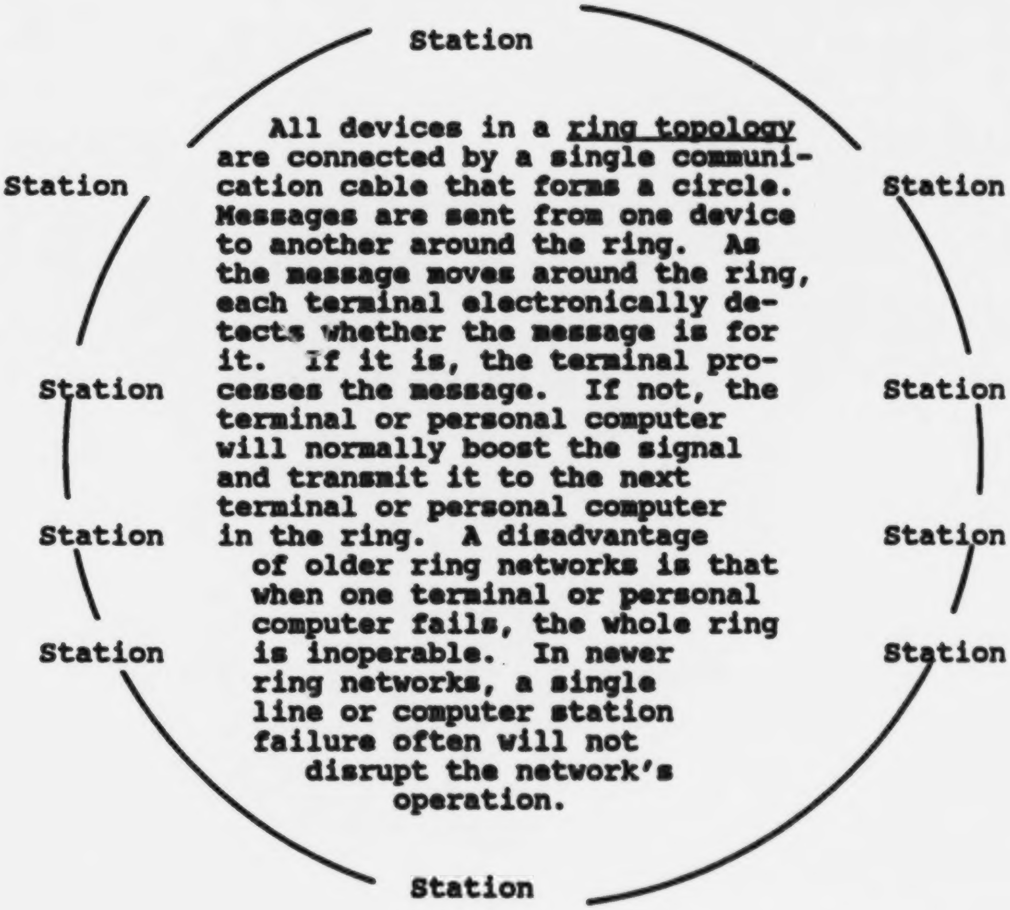
An advantage of the bus topology is that devices can be attached to or detached from the network at any point without disturbing the rest of the network. If one personal computer on the network fails, this does not affect the other users on the LAN.

STAR TOPOLOGY



When the star topology is used, each personal computer or terminal is connected through a central controlling unit (called a node) which handles the tasks of receiving and routing messages to the various stations. If station 2 sends a message to station 3, station 2 indicates to the controlling unit that transmission is to take place. Station 1 then sends a signal to station 3 that a message is to be sent from station 2 and establishes the connection between the two. If the node is not working, the network cannot function. The star topology is the oldest network configuration and is used for both local and long-distance networks.

RING TOPOLOGY


Station
Station
Station
Station
Station
Station
Station
Station
Station
Station

All devices in a ring topology are connected by a single communication cable that forms a circle. Messages are sent from one device to another around the ring. As the message moves around the ring, each terminal electronically detects whether the message is for it. If it is, the terminal processes the message. If not, the terminal or personal computer will normally boost the signal and transmit it to the next terminal or personal computer in the ring. A disadvantage of older ring networks is that when one terminal or personal computer fails, the whole ring is inoperable. In newer ring networks, a single line or computer station failure often will not disrupt the network's operation.

NETWORK TERMINOLOGY

PUBLIC DATABASES
VALUE-ADDED NETWORKS
LANS
PACKET SWITCHING
TOPOLOGY
BUS
RING
STAR
NETWORK ACCESS
POLLING
CSMA-CA
CSMA-CD
CONTENTION
TOKEN PASSING
PROTOCOL
COMPATIBILITY
EDITABILITY
CONNECTIVITY

NETWORK SERVERS

ADDITIONAL NETWORK DEVICES WHICH SERVE A SPECIFIC PURPOSE:

FILE SERVERS

PRINTER SERVERS

GATEWAYS

BRIDGES

UTILITY SERVERS

SOFTWARE

non-physical instructions
and data contained in
and carried by the
computer's electrical circuitry

FUTURE TRENDS IN SOFTWARE DEVELOPMENT

MORE INTEGRATED APPLICATIONS
TO ACCOMMODATE LARGER HARDWARE
CAPACITIES

SIMPLIFIED PROGRAMMING

EXPERT SYSTEMS (AI)
WHICH USE HUMAN-LIKE
REASONING SKILLS

NATURAL LANGUAGE
WHICH COMES CLOSE TO DUPLICATING
HUMAN COMMUNICATION

FIRMWARE PROGRAM CHIPS

(WILL BE MORE SOPHISTICATED,
COST MORE, EASIER TO USE,
AND FASTER)

APPLICATIONS SOFTWARE

GENERAL-PURPOSE

WORD PROCESSING
SPREADSHEET
DATABASE MANAGEMENT
GRAPHICS
COMMUNICATIONS

APPLICATIONS SOFTWARE

SPECIAL-PURPOSE

DESKTOP PUBLISHING
DESKTOP MANAGEMENT
INVENTORY CONTROL
REAL ESTATE MANAGEMENT
AIRLINE RESERVATIONS
DOCTORS' INFORMATION PROGRAMS
RECORDS MANAGEMENT

APPLICATIONS SOFTWARE

ENHANCEMENT APPLICATIONS
ARE
ADD-ONS OR
UTILITIES PROGRAMS

SUCH AS:
SPELL CHECKERS
GRAMMAR CHECKERS
THESAURUSES
PRINTING DRIVERS
SIDEWAYS PRINTING PROGRAMS

SYSTEMS SOFTWARE

OPERATES BETWEEN APPLICATIONS SOFTWARE AND COMPUTER HARDWARE TO ENABLE COMPUTER TO OBEY THE COMMANDS OF THE APPLICATIONS SOFTWARE

DOS

(DISK OPERATING SYSTEM HANDLES MOST OF COMMANDS ASKED OF APPLICATIONS SOFTWARE AND DIAGNOSES SYSTEM)

OPERATING SYSTEMS FAMILIES:

MS-DOS
PC-DOS
OS-2
CP/M
ProDos
Unix
Xenix
OTHERS?

SOFTWARE PIRACY

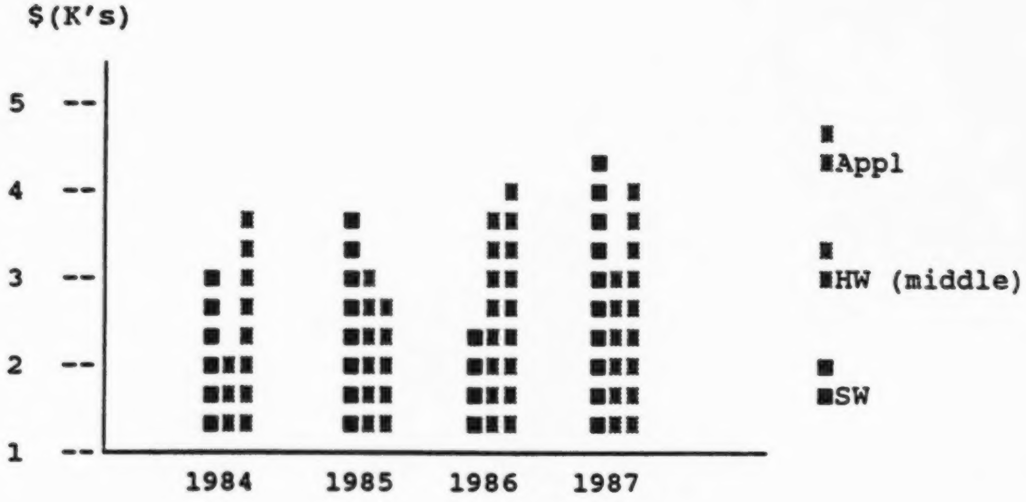
THE ILLEGAL DUPLICATION
OF SOFTWARE.

PRIMARY LAWS USED
TO PROTECT SOFTWARE
MANUFACTURERS ARE
FEDERAL COPYRIGHT LAWS.

IT IS NEVER ALL RIGHT
TO MAKE COPIES FOR
FRIENDS, NEIGHBORS,
OR CO-WORKERS.

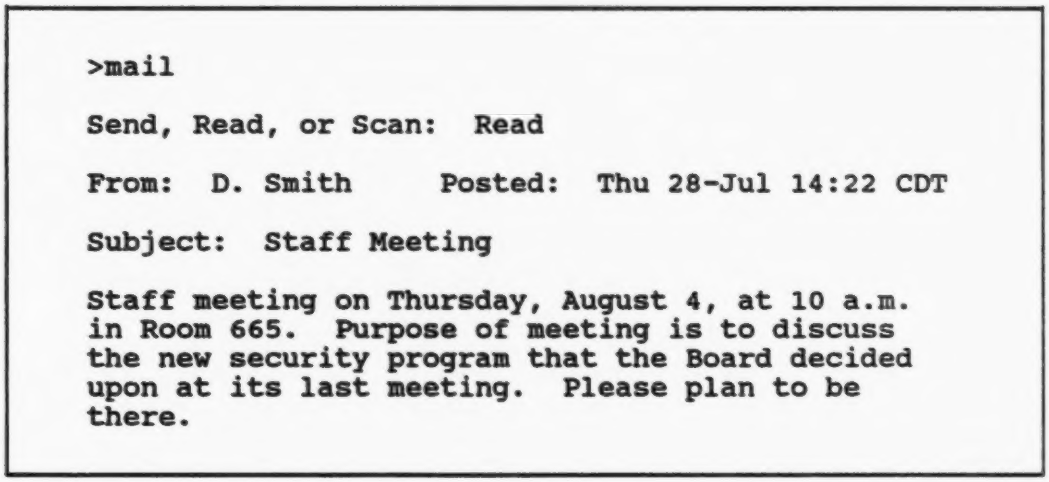
WHAT IS YOUR ATTITUDE
TOWARD UNAUTHORIZED
USE OF SOFTWARE?

EXAMPLE OF GRAPH CREATED WITH WORDPERFECT SOFTWARE



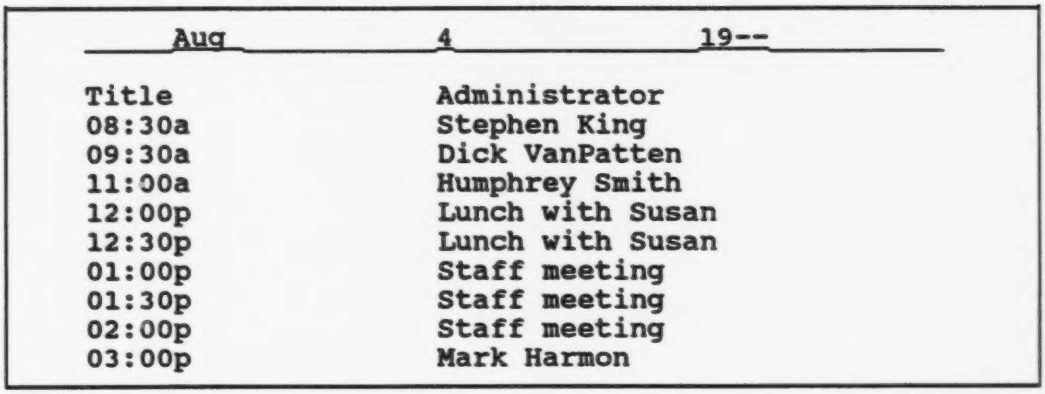
DP REVENUES FOR CONSOL INDUSTRIES

EXAMPLE OF E-MAIL SCREEN



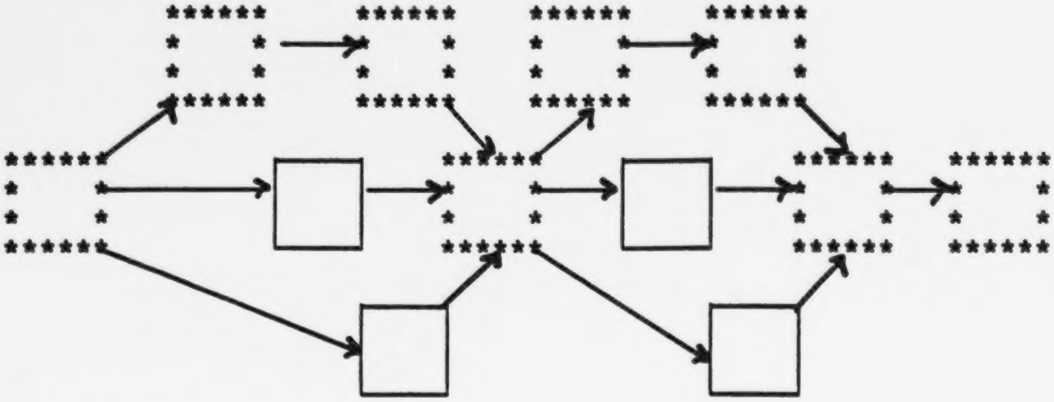
```
>mail

Send, Read, or Scan:  Read

From:  D. Smith     Posted:  Thu 28-Jul 14:22 CDT

Subject:  Staff Meeting

Staff meeting on Thursday, August 4, at 10 a.m.
in Room 665.  Purpose of meeting is to discuss
the new security program that the Board decided
upon at its last meeting.  Please plan to be
there.
```

Figure 1.



```
    Aug              4              19--

Title               Administrator
08:30a              Stephen King
09:30a              Dick VanPatten
11:00a              Humphrey Smith
12:00p              Lunch with Susan
12:30p              Lunch with Susan
01:00p              Staff meeting
01:30p              Staff meeting
02:00p              Staff meeting
03:00p              Mark Harmon
```

EXAMPLE OF ELECTRONIC CALENDAR



A PERT CHART

IN THE CHART ABOVE, THE BOXES REPRESENT TASKS; THE ARROWS INDICATE THAT THE FIRST TASK MUST BE COMPLETED BEFORE THE SECOND CAN START.

CPM IS COMBINED ON THIS CHART WITH PERT. THE BOXES MARKED WITH AN * REPRESENT THE CRITICAL PATH. IF CRITICAL PATH TASKS TAKE LONGER THAN ESTIMATED, THE PROJECT WILL BE LATE.

FORMAT FOR SOFTWARE EVALUATION PRESENTATIONS

NAME OF SOFTWARE
TYPE OF SOFTWARE
VERSION NUMBER AND DATE
DEVELOPER (MANUFACTURER)
COST
REQUIREMENTS TO RUN SOFTWARE
PRINTERS SUPPORTED
DESCRIPTION OF FUNCTIONS
TERMINOLOGY ENCOUNTERED
REPORT ON ONE MAGAZINE REVIEW
VALUE TO AUTOMATED OFFICE
DOCUMENTATION
LIMITATIONS
RECOMMENDATIONS

Computer Business Applications II

course two

Student Materials

COMPUTER BUSINESS APPLICATIONS II

Exercise 1-1

1. Define professional workstation.

2. Name a few of the components of the professional workstation.

3. Name the components of the personal computer.

4. Name and describe four other categories of computers found in the automated office besides the microcomputer.

5. What are the purposes of the video display on a personal computer?

6. List the features of video display terminals?

7. Name and describe the four of the five kinds of displays which could be used on a personal computer?

8. List advantages and disadvantages of non-display terminals.

9. The keyboard on a computer is generally thought of as a(an) ____________ device. Name the keys on a computer keyboard which make it different from the traditional typewriter keyboard.

What kinds of functions do these keys serve which make the operator more productive?

10. List and describe other input devices.

11. Define CPU.

12. Define the following components and terminology related to the CPU.

Motherboard:

Microprocessor chip:

Microcomputer chip:

Memory chip:

Working storage or main storage:

RAM:

ROM: ______________________________

PROM: ______________________________

EPROM: ______________________________

CMOS: ______________________________

Volatile: ______________________________

Nonvolatile: ______________________________

13. Define auxiliary storage.

____

14. Define the different types of auxiliary storage and related terminology listed below:

paper tape: ______________________________

magnetic tape: ______________________________

magnetic cards:

floppy disks:

random access:

hard disks:

Winchester disks:

RAM disks:

bubble memory:

holography:

optical disks:

CD-ROM:

sequential access:

15. Define peripheral.

16. Define the following peripherals and related terminology:

printer:

background printing:

letter quality printer:

near letter quality printer:

dot matrix printer:

nonletter quality printer:

ink jet printer:

intelligent printer:

17. What are plotters and how are they utilized in the automated office?

18. List factors to consider when selecting a printer or plotter.

19. Define OCR.

20. What are the benefits of the OCR to the automated office?

21. Define image processor? What are two of the most common image processors used in the automated office?

22. What are some of the more common abuses of image processing equipment?

23. Define phototypesetting.

24. List the advantages and disadvantages of phototypesetting equipment to the automated office.

25. When selecting a reprographic process, what are some of the factors to be considered?

26. Define telecommunications.

27. Define the following telecommunications devices and terminology.

downloading: ______________________________

uploading: ______________________________

modem: ______________________________

acoustic coupler: ______________________________

external modem: ______________________________

internal modem: ______________________________

intelligent or smart modem: ______________________________

28. What have been some of the more traditional methods of communication in the office?

____

29. What are some of the telecommunication delivery systems that can be used in the professional workstation?

____

30. Define the following delivery systems and related terminology.

computer-based message systems (CBMS):

computer-based voice message systems (CBVS):

voice reminder systems:

voice store and forward systems:

facsimile:

communicating word/information processors:

teleconferencing systems:

31. Define network.

32. List and define the three kinds of networks. Use the back of this page, if necessary.

33. What are the three most important applications of local area networks?

34. What is packet switching?

35. What is polling?

36. What is token passing?

37. Name and illustrate the three most common types of network topologies. List at least 2 features of each one. Use a separate sheet of paper to do this.

38. What does protocol mean as it relates to telecommunication.

39. Discuss the issue of compatibility.

COMPUTER BUSINESS APPLICATIONS II

Exercise 2-1

ATTITUDE TEST REGARDING ETHICS OF INFORMATION PROCESSING

Directions: Place a check mark in the space provided which most nearly reflects your opinion of the situation presented.

1. In the department in which you work, the computer programmer runs programs at work which are homework assignments for the courses she is taking at the local junior college. The programs are run when the computer is idle; that is, not being used for departmental business.

   Ethical _____ Unethical _____ Computer crime _____

2. A student in a computer class gives out a password to other students (roommates) who are not enrolled in the class. The students in the class are required to pay a laboratory fee. The password permits access to the departmental VAX. One of the roommates uses the password to access the VAX for two hours to complete an assignment for another class.

   Ethical _____ Unethical _____ Computer crime _____

3. A support professional uses the electronic spreadsheet from work on her personal computer at home to do a moonlighting job. The licensing agreement that came with the software when it was purchased by the company indicates use of the software is authorized only for her microcomputer on the job. The support professional argues that it is unfair to have to pay $500.00 for the software package to use just once at her home.

   Ethical _____ Unethical _____ Computer crime _____

4. A copy of a computer program developed by a programmer on the job is given to a friend at school.

   Ethical _____ Unethical _____ Computer crime _____

5. While accessing and updating personnel records in the Insurance Department, the clerk accidentally accesses the records for the Salary Administration Department. This means that the clerk broke a security code and had access to confidential salary information. When confronted with the illegal information on the computer screen, the clerk only smiled and said, "I guess I

pushed the wrong keys." The clerk did not make any use of the information.

Ethical _____ Unethical _____ Computer crime _____

6. There are software programs on the market which allow users to duplicate word processing, spreadsheet, or database management programs, or other applications software even though the manufacturer has built in copy protection features. You buy such a program and make a copy of a word processing program for backup purposes only.

Ethical _____ Unethical _____ Computer crime _____

7. While your boss is out of the office, the support professional reporting to your boss's boss comes in and accesses your boss's voice mail, even the "confidential" mail. You ask her if she is authorized to do this and she says that her boss told her to do it.

Ethical _____ Unethical _____ Computer crime _____

8. A friend who works for your competition asks you to send her a copy of a computer program which was developed by your departmental programmer. This program had to do with downloading and uploading data related to production figures from the microcomputer to the mainframe.

Ethical _____ Unethical _____ Computer crime _____

9. Sometimes on the job you use your computer to complete work totally unrelated to the job. For example, you may type papers (your own and others for which you are paid), set up database management files for outside volunteer organizations, or keep books for a small business. You use your idle time to complete these tasks; but also you use company materials for printing, diskettes for storing, and work time for completing the tasks.

Ethical _____ Unethical _____ Computer crime _____

(Adapted from COMPUTER FUNDAMENTALS FOR AN INFORMATION AGE, Gary B. Shelly and Thomas J. Cashman, 1984. Brea, CA: Anaheim Publishing Company, Inc.)

COMPUTER BUSINESS APPLICATIONS II

Exercise 2-2

CLASSROOM DESKTOP PUBLISHING PROJECT

Problem: We need to develop and produce a one-time newsletter for the department. In order to complete this project the following steps should be taken:

1. Assemble the information for the newsletter. This is the "copy".

2. Assemble the photographs and graphics for the newsletter.

3. After the text and graphics have been collected, draw a rough layout or diagram of the newsletter, answering the following questions:

   (a) How many columns of type on each page?
   (b) Will the columns be justified on one side or both sides?
   (c) Will vertical or horizontal lines be used to separate items?
   (d) What size type or font will be used for copy? for headlines? for fillers? under photographs?

4. After these decisions are made, load the appropriate desktop publishing software. (If page composition software is not available, word processing software can be substituted to enter the text and pictures can be pasted on the page and then printed and copied on a copy machine.)

   With desktop publishing software, the decisions which were made above can be built right on the computer screen, including photos and graphics. The page as originally laid out can be seen on the screen. Changes can be made regarding font size, size of photos or graphics, width and number of columns, etc. One set of commands will move a graphic from the top of a page to the bottom, another will wrap text around it, another will relocate text from one page to another, and so on.

   The resulting page layout is called a mechanical which is used to print as many copies as needed. Normally, documents created with desktop publishing software are printed on a laser printer. However, if a large number of documents is needed, the printout of the mechanical can be used for reproduction at a print shop or on a high-speed copier. If only a few copies are needed, all the copies can be made on the laser printer.

Last minute changes easily can be made by recalling the page to the screen, making the alterations, and printing the new version.

5. Distribute the newsletter to the appropriate persons.

6. Hand to the instructor for evaluation.

COMPUTER BUSINESS APPLICATIONS II

Exercise 2-3

PROJECT PLANNING PROBLEM

Problem: We need to determine the resources and tasks necessary to create a training manual for the database management program used in our classroom. Some of the necessary tasks are deciding what the content of the manual will be, typesetting, preparing the layout, printing the manual, testing the material, and rewriting if necessary. Some of the resources include writers and the typesetting capability. You may be able to think of other tasks and resources besides these that are listed.

Decide whether to use a flow chart, time line, or bar graph to illustrate the work on this project. The whole project should take about two months.

OR

Use the desktop publishing exercise: Determine the resources and tasks necessary to create a departmental newsletter. Some of the necessary tasks are deciding what the content of the newsletter will be, typesetting, preparing the layout, and printing the newsletter. Some of the resources include gatherers of information and photographs and graphics, writers, the typesetting capability, and the printing source. You may be able to think of other tasks and resources besides these that are listed.

Decide whether to use a flow chart, time line, or bar graph to illustrate the work on this project. The whole project should take about two months.

To complete the requirements of either project:

1. List all the tasks and time lines for completion of the training manual. What additional tasks can you think of that are not already listed above?

2. List all of the resources needed to complete the project. What additional resources can you think of that are not already listed above?

3. Decide what kind of chart to use to depict tasks, time lines, and resources: bar chart, time line, flow chart, GANTT chart, PERT chart, or CPM.

4. Prepare a transmittal memo to your instructor to include with the chart showing the time line for the project.

5. If the typesetting or desktop publishing software is not available in the classroom by the time it is needed, determine the one best way to proceed, given these two alternatives:

    a. Use an outside printer and pay $550 for the entire project, or
    b. Use the typesetter on campus who will charge us $10.00 an hour at eight hours a day for six days.

    Do a what-if comparison between the two alternatives. Make your recommendation in writing and include the justification. Prepare a second memo to your instruction which would include your recommendation with justification.

COMPUTER BUSINESS APPLICATIONS II

Exercise 2-4

DESKTOP UTILITY PROBLEM

For this part of the course, find at least five software packages which do telemanagement. Enter the names, addresses, and phone numbers into an electronic index (if available in the classroom). On the notepad, list a few of the features of each one of the five packages which makes one program different from another. If software is not available, turn in five 4x6 note cards, one for each of the software packages, with the requested information on each one. Be prepared to give a short oral report on your findings.

COMPUTER BUSINESS APPLICATIONS II

EVALUATION FORM - SOFTWARE PRESENTATIONS

Name of software

Type of software (if not readily recognizable in the name of the software)

Version number and date

Developer (vendor, manufacturer)/name of company

Cost: list vs actual? what is included? license agreement? can back-up copies be made? vendor availability for problems [toll-free number]? are updates available at low cost? networked versions available? etc.

Requirements to run software: compatibility with hardware (specifically, type of PC, model #, etc.)? RAM required to support software? other peripherals required or supported? cabling required and available?

Printers supported or configuration requirements

Description of the scope of the functions of the software: what it is purported to do? ease with which it accomplishes the functions?

Terminology encountered: familiar or too many new terms? who could use it in the automated office and for what purposes?

Report on at least one review of the software in a current computing magazine or research service write-up to get the users' viewpoint. (These services include DataPro or Seybold reports.)

Value of the software to the automated office: will it save time? enhance decision making? etc.

Documentation: easy to read? learning disk or tutorial included? on-line help?

Limitations encountered with the software: what do you see as the drawbacks (keeping in mind that the perfect piece of software is never available)?

Recommendations: is it worth the cost? is it going to automate repetitive tasks or enhance decision making? what will be accomplished through the purchase of this software by a company? would documentation need to be rewritten? training required? other?

COMPUTER BUSINESS APPLICATIONS II

Exercise 5-1

CASE STUDY

You are the administrative assistant for the Vice President of Administrative Services for a large international bank with headquarters in New York City. The scope of the vice president's job includes the computer system for the bank. The responsibility for the computer system in this bank also involves implementing office automation tools.

Presently, the system has permitted each department to do its "own thing" in acquisition of hardware and software; therefore, most departments have word processing, spreadsheet, database management, graphics, and some desktop publishing capabilities. Fortunately, most of the departments are using IBM or IBM compatible equipment and software. Printer quality varies, depending on the department. The quality ranges from dot matrix in the bookkeeping department to HP LaserJet Series II in the top executives' offices. Desktop publishing is being done by the public relations department on a Macintosh, using Aldous Pagemaker and an Apple LaserWriter.

There is neither electronic communication nor networking being done between or within departments. Some departments have capabilities of accessing information in the bank's mainframes by way of dumb terminals--CRT's which can be accessed for "information only". Generally, this is done when customers call in for account balances, loan data, or other inquiry-type information. In other words, the end users cannot change the information that resides in the mainframe's databank.

Your supervisor has asked you to serve on a task force with four or five other administrative assistants and banking professionals in the headquarters to make suggestions for replacing existing hardware and software and other peripherals so that the entire headquarters unit is using the same or compatible equipment. If the system is successfully implemented in the headquarters, it will be adopted by the entire bank system. Your supervisor thinks this is also a good time to implement other capabilities. Specifically, the new system should enable the personnel in the headquarters to do the following:

(1) continue, if possible, to use the word processing, spreadsheet, database management, graphics, and other applications software files which have been created by each department

(2) share data files with other offices in the headquarters and the bank's offices in other states and other countries (eventually)

(3) establish access to, linkages with, and passwords for the records and data which are stored on one of the bank's mainframes for all persons associated with the headquarters (and, ultimately, all persons in other offices) who will need to access and manipulate the data

(4) communicate internally with other offices in the headquarters building

(5) communicate externally with branches in other states and countries (ultimately)

(6) establish electronic mail boxes to alleviate 'telephone tag' and to avoid higher mailing costs (By the way, the bank does have a new Rolm telephone system which has voice mail on it.)

(7) establish central locations in the headquarters for printers/copiers in order to utilize this equipment more effectively and efficiently

(8) receive training on the system and documentation support when the proposed system is adopted: who will do the training, how will it be offered (classroom, on-the-job, videotape, etc.), how often will it be offered, and to whom, etc.

(9) provide for upgrading and updating the system

(10) pinpoint areas of future growth and expansion

****

The specific assignment given to the task force is to:

1. make a recommendation for hardware, software, and other peripherals which will be utilized at all levels of the organization, including bank officers, in the headquarters and (ultimately, branch locations). The factors outlined above should be taken into consideration and addressed in the report.

2. make a formal oral presentation which would include the use of visual aids and a formal written presentation to the bank president (instructor).

A formal presentation has been scheduled for the bank president's staff in one month so that a decision can be made and implemented.

Computer Business Applications II

course two

Evaluation

SUGGESTED EVALUATIONS FOR COMPUTER BUSINESS APPLICATIONS II

Since many of the exercises in this course will be evaluated based on subjective determination of proficiency of human relations, oral, and written skills, it is difficult to develop objective instruments which will be applicable. For this reason, several suggestions are included in this section for your consideration.

1. An evaluation form entitled, Critique of Oral Presentation, is offered for your use. A suggested grading scale might look like this:

50 points	A	30 points	C
45 points	A-	25 points	C-
43 points	B+	23 points	D+
40 points	B	20 points	D
35 points	B-	15 points	D-
33 points	C+	10 points	F

2. An evaluation form entitled, Critique of Written Report, is offered for your use. The suggested grading is the same as in #1:

50 points	A	30 points	C
45 points	A-	25 points	C-
43 points	B+	23 points	D+
40 points	B	20 points	D
35 points	B-	15 points	D-
33 points	C+	10 points	F

   In this way, the written and oral presentations are weighted the same.

3. The third form included in this section is intended to evaluate students' hands-on production work--their proficiency in using the software package.

4. The fourth form included in this section is intended to evaluate students' understanding of the software package but not their proficiency as the evaluation in #3.

Regardless of the format used for evaluation, it is strongly suggested that the evaluation forms be shared with students prior to their first evaluation so that they are aware of the standard of performance required in the course.

CRITIQUE OF ORAL PRESENTATION

The statements below should be evaluated according to the following scale:

5 - Excellent
4 - Good
3 - Average
2 - Fair
1 - Unacceptable

NAME OF PRESENTOR ______________________________

TOPIC OF PRESENTATION ______________________________

DATE OF PRESENTATION ______________________________

Please circle the number which best indicates your feeling toward the presentation.

1. The manner in which speaker introduced himself/herself 5 4 3 2 1
2. The manner in which topic was introduced 5 4 3 2 1
3. Identification of objectives in the presentation 5 4 3 2 1
4. Manner in which presentation was organized 5 4 3 2 1
5. Manner in which presentation was delivered 5 4 3 2 1
6. Degree of enthusiasm projected 5 4 3 2 1
7. Degree of effectiveness of presentation to students 5 4 3 2 1
8. Degree of professionalism exhibited during the presentation 5 4 3 2 1
9. Use of visual aids or materials during presentation 5 4 3 2 1
10. Degree to which the audience was included in the presentation 5 4 3 2 1

OVERALL POINTS FOR PRESENTATION ______________

Comments: ______________________________

____

____

CRITIQUE OF WRITTEN REPORT

The statements below should be evaluated according to the scale provided after each component:

NAME OF WRITER ________________________________

TOPIC OF REPORT ________________________________

DATE OF REPORT ________________________________

Please circle the number which best indicates the evaluation of the report.

1. The physical aspects of the report: (page layout, margins, form and content of title page, placement and spacing of captions, neatness, etc.) — 5 3 1
2. The organization of the report: (logic in arranging information, wording of captions, etc.) — 10 8 6 4 2
3. Content and analysis of the report: (adequacy of coverage, pertinence, quality and quantity of information, completeness of introductory material, logical analysis) — 15 13 11 9 7
4. Quality of writing of the report: (style: dullness, interest quality, objectivity; readability: clarity, conciseness, completeness, sentence structure, word choice; coherence: appropriate summary, conclusion, and forward-looking parts) — 20 18 16 14 12
5. Graphics included in the report: (suitability, correctness, appearance) — (5 4 3 2 1)

OVERALL POINTS FOR REPORT ____________

(Total may be more than 50 points if graphics are included.)

Comments: ____

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Suggested

EVALUATION SHEET
(Proficiency)

NAME: ______________________________ DATE: ______________

Name or # of Assignment: ________________________________

No. of items due in assignment: ________________

No. of items completed: ________________

Possible points: ______100______

****

Evaluation points:

50 Mailability: (0 if any errors. For mastery learning, correct and return until mailable; however, instructor will set the standard.) ________________

Proofreading skills evaluated here.

20 Language arts, grammar, etc.: ________________

20 Following directions for assignment and decision-making: ________________

10 Arrangement, placement, spacing: ________________

100 Possible points

TOTAL EVALUATION POINTS: ________________

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Comments: ____

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Suggested
EVALUATION SHEET
(Understanding)

NAME: ______________________ DATE: ____________

Name of Software Package: ______________________

Purpose of Software Package: ______________________

Possible points: 100

****

Evaluation points:

30	Grasp of purpose of software package: word processing, database management, spreadsheet, communications, integrated, graphics, desktop publishing, desktop management, project management, etc. Are the completed projects representative of the software's capabilities?	____________
20	Language of software: can the student define the terms used in the software?	____________
30	Maneuverability within the software: Ask the student to access the directory, create a document, save the document, and print it (or other).	____________
20	Following directions for assignment and decision-making:	____________
100	TOTAL EVALUATION POINTS:	____________

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Comments: ______________________

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Computer Business Applications II

course two

References

WHAT'S HOT IN SOFTWARE

Specifically, the following applications software packages are now on the market:

Timeout Desktools^{TM}: Comes equipped with a clock, calendar, appointment scheduler, task list, calculator, notepad, dialer, envelope addresser, and more. Other software packages which fall into the desktop management area are: Sidekick, WordPerfect Executive or WordPerfect Library, PC-Tickle, Pinpoint Desktop Accessories, plus others.

Info-XL: Is a personal information manager which organizes text and structured data; it features data-management facilities, import/export capabilities, free-form text processing, and data links.

Simply Accounting: Includes general ledger, payables, receivables, payroll, inventory, and job cost modules on one disk. Other accounting software also available include: Easy Business Systems, In House Accountant, Inventory, Time-Billing & Receivables, Retail Invoicing, BPI software, etc.

Daily Routine: A sales activity-management software program, including a name and address file, call and time reports, expense and mileage reports, a daily agenda, a sales-call note screen, a quotation screen, and a quick-memo word processor. Another software package related to sales is EasySales Pro which combines with EasyWriter to generate letters.

Schedule View: Is a project manager that helps design the schedule on-screen using commands such as block copy, move, or erase. Can perform basic calculations and print standard reports. Other project manager software includes: Time Line, SuperProject Plus and SuperProject Expert, QuickPlan, Everybody's Planner, WordPerfect Library, 20/20, etc.

Wisard Forecaster: A Lotus 1-2-3 add-on which is based on a technique that runs four forecasts and combines them for a final forecast. Can project future trends, levels, and seasonability, based on historical data. Uses spreadsheet arrangements: rows, columns, blocks of data, calculations; outputs in reports and graphs. SuperCalc4 includes decision support tools, such as forecasting and modeling.

Black Magic: Links objects or thoughts to related thoughts, allowing nonsequentially organized documents to be created--a hypertext word processor. Can integrate text and graphics. Can be read with programs developed for CGA, EGA, and Hercules modes. A reader program for the Macintosh, Amiga, and Atari ST is being developed. The reader programs are public domain.

Total Word: Offers word processing, graphics capture, over 400 scientific and technical symbols, and a selection of printer drivers and HP LaserJet fonts. Has an editorial revision feature that allows sharing a document with others, making revisions and changes, and attaching comments. Includes automatic index, outline, footnote, and table of contents generation. Includes thesaurus and dictionary. Features include desktop publishing, box drawing, and production of columns of text and graphics.

Fill & File: Creates on-screen a duplicate of the form to fill out. Information can be imported from dBASE, ASCII, Lotus 1-2-3, or other files. Can tab from blank to blank and fill in individual forms. Pull-down menus assist in designing the form. Choices of solid, bold, or dotted lines; text sizes; and automatic box drawing. Text-editing capabilities allows overwrite of text, wordwrap, underline, bold, center, justify, and reformat paragraphs. Can use color and graphic symbols. Can perform math functions and total columns. Can export DOS-compatible extended ASCII files; saves data to data files rather than to just the form file.

Ray-Net Communications Systems: A wireless LAN that communicates among computers at a data rate of 19.2K bps. Consists of a plug-in card, an RF transceiver with antenna, and proprietary communications software that is compatible with Novell's Advanced NetWare. Can bridge Ray-LAN into existing NetWare LANs that run on wired topologies such as Token-Ring or ArcNet.

Add dClock to IBM PS/2 Model 25: Microsync's slotless dClock II plugs into the back of the Model 25's floppy disk drive to be installed in the Model 25. Package includes software and special cable. Allows user to access clock rather than enter time and date every time the computer is turned on.

Add others here...

Communications: PC-TALK, ASCII Express, CrossTalk, Enable, Communications Support (TrueBASIC, Inc.), Electric Desk, Point-to-Point, SmartCom, and many more.

Writing analyzers: Grammatik II, PC-STYLE--to name a few. A new area of software development to watch.

What are some others?

Computer Law 1988

by Jordan J. Breslow

The American legal system changes slowly. By sharp contrast, technology appears to be changing at an accelerating pace. Innovations in computer technology have sometimes created problems which the legal system was ill-equipped to handle. During the past few years, however, the law has begun to catch up with the computer world. Copyright law now protects the "look and feel" of computer programs. Federal and state laws make it a crime to gain unauthorized access to someone else's computer system. And the federal wiretap law has been updated to restrict governmental eavesdropping on communications sent by modem.

Copyright Law

Most computer software is protected by copyright law. To the user, this means that making copies of programs and sharing them with friends and co-workers is a violation of federal law. But copyright law also affects users in a more subtle way. Because software manufacturers rely on copyright law to prohibit the sale of products that resemble their own too closely, copyright law can affect the number of competing products available to the user.

During the past few years, the courts have strengthened the protection which copyright law provides to computer software. Judges have been asked to apply one of the most fundamental rules of copyright law—a rule conceived hundreds of years ago— to the newborn technology of computer software. The rule is that ideas cannot be copyrighted.

Suppose you're an artist and you paint a picture of a boy riding a horse in a meadow. Your artwork consists of an idea—the idea of a picture of a boy riding a horse in a meadow—and an expression of that idea on canvas. The idea is not protected by copyright. Any other artist is free to paint his own picture of a boy riding a horse in a meadow. But your expression, i.e., the actual picture you painted, is yours alone. If another artist copies your picture, he has infringed your copyright.

There is a line somewhere between unprotectible ideas, which imitators can copy, and protected expression, which cannot be copied without copyright infringement. Where do you draw that line when considering a computer program, such as a word processor? At one extreme, the basic idea of a program that processes words cannot be copyrighted. If it could, there would only be one word processor on the market. At the other extreme, the actual programming code (source code) which makes a particular word processor work is an expression which is clearly protected by copyright.

Between these two extremes lie program features which are harder to classify as unprotected ideas or protected expression. What about a program's keystrokes, for example. Can a word processing program adopt Wordstar's keystrokes? Quite a few programs on the market do. Sidekick, for example, uses the Wordstar commands for such things as moving text and moving the cursor. What about a program's menus? Are they unprotectible ideas which anyone can imitate, or expression which are protected by copyright?

The answers to questions like these may determine how many inexpensive "compatible" or "clone" programs will be on the market in years to come. That's why lawyers and software vendors are talking about a decision by Judge Orrick in a case in federal court in San Francisco. Judge Orrick's decision may affect the availability of clone software in years to come.

The combatants squaring off before Judge Orrick were Broderbund Software, which sells The Print Shop, and Unison World, which sells Printmaster. Both programs allow users to create signs, banners and the like. Printmaster was designed to resemble the overall structure, sequence and arrangement of The Print Shop's screens. Judge Orrick ruled that the structure, sequence and arrangement of screens was an expression, not just an idea. And the judge went on to explain that the "total concept and feel" of Printmaster was similar to "total concept and feel" of The Print Shop.

The Broderbund decision has been loosely referred to as the "look and feel" case. Many commentators believe that under *Broderbund*, a clone or compatible program which looks and feels exactly like the program it imitates will be an illegal infringement. If that analysis is correct, the future of inexpensive copycat programs will be in doubt.[1] Strong copyright protection for computer programs is not necessarily bad for the consumer, however. Copyright gives programmers an economic incentive to develop new software. In the absence of strong copyright protection, creative software companies would spend money on product development only to find their products cloned and sold at lower prices by companies who had not paid for the development.

In future copyright cases, the courts will be striking a balance between the principle that ideas should be free for all the world to share and the tenet found in the United States Constitution that artists, authors, programmers and others should be rewarded for their creativity.

Hackers Beware

It's 10:00: do you know where your data is? Perhaps the teenage whiz kid next door is snooping through it. Or

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maybe a disgruntled former employee is browsing through the personnel records on your hard disk. If so, call the police, the attorney general or the FBI. Computer snooping is now a crime.

Unauthorized access to computer systems, nicknamed hacking, received a great deal of attention in the media, in Congress and in state legislatures around the country. When the problem first came to light, the media sometimes characterized hacking as a pesky but harmless activity by clever pranksters. But the public soon realized that the potential for harm is enormous. For example, in 1983 a group of youngsters calling themselves the "414 Gang" broke into a computer system at Memorial Sloan-Kettering Cancer Center in New York. The intruders gained access to the radiation treatment records of over 6,000 patients, and had the ability to alter the radiation treatment levels prescribed for individual patients.

At least 47 states have now passed laws which establish criminal penalties for electronic voyeurism. California's legislature, for example, resolved "to discourage 'browsing,' which has led to significant destruction of property and numerous instances of invasion of privacy, as well as to punish the more serious offenders . . ." It is therefore illegal to "maliciously" access a computer system and alter, delete or damage a computer system. Malice roughly means an intent to do harm. Simply accessing a computer without authorization is also a crime.

The Federal counterpart is the Computer Fraud and Abuse Act of 1986. The federal law generally pertains to computer crimes which are committed across state lines, or which involve the government's computers. Crimes under this act include

- Obtaining information contained in a financial record of a financial institution or information contained in a consumer credit agency's file
- Obtaining unauthorized access to U.S. Government computers
- Altering data concerning an individual's medical condition in a computer
- Giving out passwords or codes for gaining unauthorized access to computers

Uncle Sam Wants Your Data

The United States Constitution was designed to protect citizens from abuses of an overzealous government. The First Amendment, for example, protects our access to information through the right of free speech. Other provisions of the Constitution protect our right to privacy, limiting the right of the government to spy on its citizens.

When the Constitution was written, the technological ability of the government to snoop and eavesdrop was quite limited. In recent years, the government's ability to control information has taken on frightening dimensions with the proliferation of computer-to-computer communications by modem.

Who Is Reading Your Electronic Mail?

After the telephone was invented, law enforcers found a new way to fight crime: listening in on private telephone conversation by means of a wiretap. In 1967, the Supreme Court declared that wiretaps were subject to the Fourth Amendment to the Constitution, concerning search and seizure. Congress then passed the Omnibus Crime Control and Safe Streets Act of 1968—the Federal wiretap law.

The wiretap law protects citizens from unwarranted governmental intrusion into private telephone conversations. It allows a wiretap only if certain procedural safeguards are observed. But by 1986 the wiretap law was hopelessly out of date. Due to the narrow definition of wiretapping, the law did not apply to new technologies such as electronic mail, cellular and cordless telephones, paging devices and video teleconferencing.

Making matters worse, the constitutional protection of privacy was thought not to apply when information was in the hands of a third party computer operator. Thus, prior to the passage of the Electronic Communications Privacy Act of 1986 (ECPA), a letter which you sent to a friend via an electronic mail service was open to the government's prying eyes, at least while it was stored in the computers of the mail service. Neither the wiretap law nor the Constitution deterred overzealous law enforcement agents.

The ECPA closed this loophole. The act struck a balance between the right of privacy and the legitimate role of the government in law enforcement. In general, communications which are stored in the computers of an E-mail service for 180 days or less can only be read by the government if it first obtains a search warrant. If the communication is stored there beyond 180 days, the government must follow prescribed procedures, generally including prior notice to the sender of the message, before it can snoop.

The Legal Future

Changes in technology will most likely continue to outpace changes in the legal system for years to come. But as attorneys, judges and legislators become more familiar with computers and the unique legal problems they create, the legal system will do a better job of protecting the interests of computer users, manufacturers, the government and the public. ■

[1] *This is legally inaccurate. If one program looks and feels like another, it is an infringement only if the clone program imitates aspects of the original program which are protected expression as opposed to unprotected ideas. For example, suppose one program displays nothing but blank lines on a screen, so the monitor looks like a piece of ruled paper. That screen display is probably an unprotected idea. If a clone program displays the same screen, it may look and feel like the original, but it is not an infringement, because it only looks and feels like an unprotected idea.*

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LICENSE AGREEMENT BETWEEN SOFTWARE MANUFACTURER AND PURCHASER

The small print on the outside of all software packages carries the following WARNING for the software purchaser and end-user:

"This product is for sale and distribution within the United States only. Customer support and updates for this product outside the U.S. are subject to a surcharge levied locally. **Opening this package indicates your understanding and acceptance of the following Terms and Conditions** (all emphases added by this writer):

"READ THE FOLLOWING TERMS AND CONDITIONS BEFORE OPENING THIS SEALED PACKAGE. IF YOU DO NOT AGREE WITH THEM, PROMPTLY RETURN THE UNOPENED PACKAGE TO EITHER THE PARTY FROM WHOM IT WAS ACQUIRED OR TO (NAME OF MANUFACTURER) AND YOUR MONEY WILL BE REFUNDED.

"The program in this package is a proprietary product of (name of manufacturer) and is protected by Copyright Law. **(Manufacturer) retains title to and ownership of the program**."

License

"You may use the program on a single computer or move the program to and use it on another computer, but under no circumstances may you use the program on more than one computer at the same time. You may copy the diskettes either in support of your use of the program or for backup purposes.

"You may permanently transfer the program to another party if the other party agrees to accept the terms and conditions of this License Agreement. If you transfer the program, you must at the same time transfer all copies of the program to the same party or destroy those not transferred. Such transfer terminates your license. You may not rent, lease, assign, or otherwise transfer the program except as stated in this paragraph.

"You may not decompile, disassemble, or otherwise reverse engineer the program. You may not modify the program in any way without the prior written consent of (the manufacturer)."

PERSONAL COMPUTER HARDWARE AND SOFTWARE USE POLICY

OF ____

Effective April 1987

In compliance with legal considerations and in keeping with ethical practices upheld by ________________________________, all employees--exempt, non-exempt, and hourly--will be responsible for knowledge of and adherence to the following guidelines related to use of personal computer hardware and software:

1. Use of all computer equipment, both hardware and software, purchased for __________________________ use is restricted to related business.

2. Each copy of purchased software programs is registered and protected by federal copyright laws and, therefore, may not be copied for home or other use. Copying for work-related use may be done only within the requirements allowed by copyright laws, and only with the approval of authorized computer center personnel.

3. Unauthorized copying of registered software programs or use of related hardware equipment for other than business is strictly forbidden and subject to discipline.

4. Only authorized computer service personnel may alter or adjust programs or equipment. Alternations or adjustments by anyone else is strictly forbidden and subject to discipline.

It is necessary for the users of ____________________________ computer hardware and software to be responsible for sharing this policy with anyone who requests the use of its hardware or software.

E-MAIL SYSTEM FOR XYZ COMPANY

To invoke the Mail Utility:

Type MAIL at the $ prompt. The computer will respond with a mail prompt: MAIL>. The computer is now ready to accept any valid MAIL command.

```
$ MAIL
MAIL>
```

***

To exit the Mail Utility:

Type the word EXIT or EX at the mail prompt (or CTRL Z). This will bring you back to the DCL level.

```
MAIL>  EXIT (or EX) or (CTRL Z)
```

***

To read your new mail messages:

All new mail messages are placed in the NEWMAIL folder automatically. The NEWMAIL folder disappears once you have read all your new messages and have exited from the Mail Utility. Your new mail is then placed in a file called MAIL.MAI which is automatically created when you receive your first mail message. To read the mail in the NEWMAIL folder, simply give the computer a RETURN <ret> at the mail prompt. If there are no new messages to be read, and you type a <ret> at the mail prompt, the Mail Utility will automatically go to the MAIL folder and start displaying the messages that you have read.

```
MAIL> <ret>
```

***

To forward a message being read:

To forward a copy of the message that you are reading or have just finished reading, type FORWARD at the mail prompt. The Mail Utility will prompt you for the new header (address) information.

```
MAIL> FORWARD

TO:       ORES::U123456
SUBJ:     MEETING NOTICE
```

***

To reply to a message being read:

To reply to a message being read or have just finished reading, type REPLY at the mail prompt. The Mail Utility will automatically set up the header information and prompt you to type in your reply.

```
MAIL> REPLY
```

```
USER, THIS IS A REPLY TO YOUR MESSAGE.  (CTRL Z)
```

***

To save a copy of the message in a file:

To save a copy of the mail message being read or just have finished reading in a file, type EXTRACT FILENAME.TXT at the mail prompt where FILENAME.TXT is a filename you want to call your file, such as MEETING.TXT. A file by that name is then saved in your account.

```
MAIL>  EXTRACT FILENAME.TXT
```

***

To display the contents of your MAIL folder:

To display a list of all the messages in your MAIL folder, type DIR for a directory at the mail prompt. You may then read a specific mail message on the list by typing the number of that message after the mail prompt.

```
MAIL> DIR
```

***

To send a mail message:

To send a mail message, type SEND after the mail prompt. The Mail Utility will prompt you for the header information and ask you to type in your message and then press (CTRL Z) to send the message.

```
MAIL> SEND
```

***

To send a file using the Mail Utility:

To send a file using the Mail Utility, type SEND FILENAME.TXT (where filename.txt is the name of the file you want to send) after the mail prompt. The computer will then prompt you for the header information of where to send the file.

```
MAIL> SEND FILENAME.TXT
```

***

Global Mail Utility:

To send a message or a file to someone and you don't know the mail address, type # when the computer asks for TO in the header information. You will then be in the Global Directory where you can look up a person's name and mail address. When you exit the Global Mail Utility, you are back at your header information point in the Mail Utility.

```
                MAIL> SEND

TO:        #
SUBJ:      NEW MAIL MESSAGE
```

***

To send mail using a distribution list:

If you frequently send mail to the same group of users, you can set up a distribution list. A distribution list is a file containing the user names of the people to whom you want to send messages. To set up a distribution list, you can either use the EDT/EDITOR at the DCL prompt to create the distribution list file with a DIS extension, or go into GLOBDIR (the Global Mail Utility) to have it build your distribution list. The distribution list file must have nodename::username for each entry.

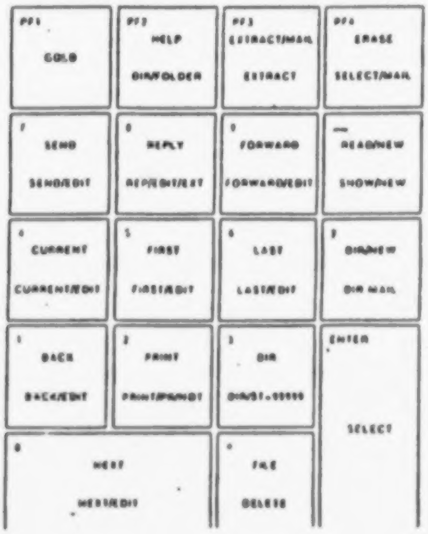
VAXMAIL GETTING STARTED COMMANDS

Command	Description
Mail	Invokes mail at $ prompt.
Help	Displays online help for VAXMAIL commands.
Dir	Displays your mail directory.
Send	To send an interactive message.
Read	To read a mail message.
Forward	To forward the message being read.
Reply	To reply to a message being read.
Exit	To exit the Mail Utility.

A keypad diagram for this particular VAX mail system looks like this:

MAIL Keypad Diagram

By default, the keypad keys on the VT200 and VT100 series terminals are defined to execute the following MAIL commands:


PF1
GOLD
PF2
HELP
DIR/FOLDER
PF3
EXTRACT/MAIL
EXTRACT
PF4
ERASE
SELECT/MAIL
7
SEND
SEND/EDIT
8
REPLY
REPLY/EDIT/EXT
9
FORWARD
FORWARD/EDIT
—
READ/NEW
SHOW/NEW
4
CURRENT
CURRENT/EDIT
5
FIRST
FIRST/EDIT
6
LAST
LAST/EDIT
,
DIR/NEW
DIR MAIL
1
BACK
BACK/EDIT
2
PRINT
PRINT/PRINT/NOTIFY
3
DIR
DIR/ST=99999
ENTER
SELECT
0
NEXT
NEXT/EDIT
.
FILE
DELETE

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